American Journal of Public Health
and THE NATION'S HEALTH

Volume 38 March, 1948 Number 3

Public Health in Britain—The Changing Scene*

SIR ANDREW DAVIDSON, M.D., F.R.C.P., F.R.C.S., F.R.S.Ed., D.P.H.

Chief Medical Officer, Department of Health for Scotland, Edinburgh

BACK in the dark days of the recent war the strenuous work of health officers in Britain was much lightened by visits, from time to time, of many distinguished medical colleagues from your country. When the outlook seemed gloomiest, these visits were alike encouraging, sustaining, and helpful. To mention all who contributed in this way would be to repeat a lengthy catalogue of names well known in many branches of American medicine. Without individually mentioning those occurring to my memory I should like to take this opportunity of thanking all who visited us then for the intellectual refreshment which they brought and for the practical advice which they gave during those critical days. For this reason alone my presence here today would be well worth while; but there are others. The opportunity of meeting leaders of public health of this country, of exchanging views, of discussing common problems, and of observing how these problems are being tackled here, would also of itself be sufficient to make for unhesitating acceptance of your Association's kind invitation to attend this 75th Annual Meeting and to make a modest contribution to its deliberations. Moreover, by inviting me personally, you have honored the Public Health Service of our relatively small—although we like to think important—country of Scotland. My colleagues at home share my high appreciation of this distinction, implicit in your invitation.

But even acceptable invitations bring their problems. In this case the most difficult one to solve is the choice of a subject for my remarks. As public health organization in Britain is in the process of rapid change, it has been suggested that an appropriate theme would be the changing scene in British public health. To me, however, it has at least two limitations. To depict clearly such a scene within the space of a few minutes is well-nigh impossible; and my more intimate knowledge of what is happening is confined mainly to Scotland. The lat-

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.

ter, however, is less important for, broadly speaking, the trends are similar over Britain as a whole; and to this extent the task is made easier, perhaps more so, because of the very close coöperation between the Ministry of Health for England and Wales and the Department of Health for Scotland. Nevertheless, any attempt to describe in the limited time at my disposal the changing scene in British public health must necessarily be confined to the broadest outline.

The present year of grace finds us, in Britain, celebrating the centenary of the appointment of the first Medical Officer of Health and, at the same time, standing on the threshold of great new developments in the organization and administration of our National Health Services. We believe that these two events are phases of the same evolutionary process of public health development in our country. A survey of the progress made in the intervening period has helped us to appreciate the philosophical and scientific background of our public health endeavor and to respect the strenuous efforts of the pioneers in preventive medicine. But it does more. It demonstrates the historical reasons for the gaps and deficiencies which exist in our present services and defines lines of approach toward future reorganization. By and large, our health problems have hitherto been tackled tactically rather than in accordance with a strategical plan, for the evolutionary movement began by the compulsion of events associated with the immense industrial developments of the 19th century. In these earlier days effort was mainly directed toward the lessening or, where possible, the removal of harmful environmental influences, the control of epidemic diseases, and the provision of medical attention through the Poor Law system for those unable to pay for it. Behind the advances there was a stimulus of social need although action was governed by fear rather than philosophy or scientific principles. Moreover, priority of public health problems was determined by the force of public opinion. As the state of medical knowledge advanced, however, public health administration came to rest on a scientific basis.

The change from the approach to better public health through cleansing, drainage, and water purification, to the approach to positive health through social amelioration and preventive and curative medicine, is both a fascinating and an instructive story. It is too lengthy, however, to relate now. As an alternative I shall pick up the thread by attempting to describe where we now stand and to touch on what we hope to achieve in the future.

As I have already indicated, the main and obvious problems which were tackled first have been, in many cases, solved or alleviated. We have traveled far as regards measures designed to prevent certain contingencies such as the outbreaks of old-time plagues. Also we have recognized that conditions not bad enough to create epidemics are nevertheless conducive to inferior physical and mental development, or to the existence of actual disease or impaired health. Thus, housing was recognized as an important influence and the effect of poor housing bore heavily upon those predisposed to mental or physical disease. Likewise, nutrition, especially during the past decade or two, has been made the subject of intensive inquiry and research, with the result that feeding now aligns itself with and, in some respects, takes precedence of housing. But the worker spends much of his day in the factory or workshop; therefore, adverse conditions there have been constantly under review. The wide advances in industrial health bear witness to the resolution with which these problems are being tackled. Similarly, the school environment, in which the growing child spends so much of his time, has been

the subject of a continuous process of improvement for the past 40 years since the School Medical Service was established.

The curative medical services, however, have up till now largely operated independently without being in full and free coöperation with the social and environmental services. Curative medicine has dealt with the casualties but has not always searched for causes any further than in the pathological and bacteriological laboratories. It has been essentially individualistic and therefore has not had the opportunity to verify its findings on a broad statistical basis. Moreover, it has not had the opportunity to search for early departures from the normal where properly applied experience would have laid these probabilities open.

A near approach, however, to a linkage with the preventive services is to be found in our Highlands and Islands Scheme for providing general practitioner, specialist, nursing and ambulance services covering the sparsely populated northern districts of Scotland. These services, apart from bringing the necessary curative medical advice to "the crofters and those of similar economic circumstances," are closely interwoven with the preventive health services, such as School Medical Service, maternity and child welfare, of the local authorities. Again, in the case of the school child, medical inspection, with the detection and treatment of minor ailments, is applied to all school children receiving publicly provided education. The School Medical Service was the first scheme to bring the benefits of preventive medicine to a large group of the population, and to recognize that early diagnosis with early treatment is prevention.

The opportunities are now at hand for all the agencies concerned with health—social and personal, preventive and curative—to get into harness together. We in Britain are about to project new developments which we hope will go a long way toward that objective. The schemes of the past have been the spearpoint of the attack and they were directed to the most vulnerable, and probably the least regarded, sections of the community. Their operations have brought to light much evidence on which to base future action. They have provided, for example, statistical information on the well-being or otherwise of infants, preschool and school children; they have disclosed the difficulties and dangers of pregnancy and childbirth; while they have given us the yardstick with which to measure trends in health and physical development. But as to the adolescent, the population at working ages, and the aged, information is meager. It is true that a medical service has been provided, through the National Health Insurance Act, 1911, for the working age groups; but this covers only 44 per cent of the population.

In Scotland, for eight or nine years before the war, annual statistics were recorded and published of the incidence of incapacitating sickness of insured persons. These have been helpful pointers to health policy. But in fact, while the National Health Insurance Act provided a sound enough though incomplete scheme for medical care of the individual worker, its influence as an instrument of preventive medicine was less potent. The medical care of the non-insured adult was dependent upon private arrangements or, for those unable to pay privately, through the medium of the Poor Law. It is only fair to say that the Poor Law has for many years provided a reasonably satisfactory individual and hospital service for those who came under its care. Its service was restricted, however, by financial qualifications and it varied in efficiency according to the type of local authority. The Poor Law

as a means of succor for the sick, and indeed for the able-bodied, is now likely to pass into the limbo of forgotten things and to be replaced on the one hand by a National Health Service which will be available to everyone, and, on the other hand, by a system of national assistance for those who require material help.

A new outlook on long-term or chronic incapacity, sharpened by the influence of war, finds expression in the development of rehabilitation as an instrument of prevention. For many years—indeed, since World War I—orthopedists have given attention to the benefits it provides for the surgical cripple. Now more interest is being shown in its possibilities in general surgery and in general medicine. No longer can the medical or surgical worker remain satisfied if he has merely succeeded in postponing the event of death or guiding his patient through an acute illness into quiescence or chronicity. He must aim at rehabilitation. The patient must be returned to circulation as an active healthy worker or brought to as high a grade of fitness as possible.

The idea of rehabilitation is accepted, but to achieve its complete fulfillment involves coöperation with other government departments than the Health Department, and with industry itself. If a patient through a residual disability is prevented from returning to his normal occupation, steps must then be taken to fit him into another occupation so that he shall not fall into the scrap heap of the permanently useless and unfit. Therefore there is now on the Statute Book the Disabled Persons Act, 1944. This Act provides for the registration of all persons with a disability and it compels employers to employ a proportion of disabled persons. It enables the Ministry of Labour to give such training as may be necessary to fit a disabled person for a new job, and to provide sheltered occupation for those for whom industry can offer no opening. Rehabilitation applies to both medical and surgical cases. It is an essential part of preventive medicine in the future because it has become clear that the provision of a useful and satisfying occupation is one of the strongest psychological factors in maintaining and in regaining health.

The changing age constitution of the population, with the increased weighting of the older age groups, is directing more and more attention toward the care of the old people and of the chronic sick. It has been in this field of health effort that the old Poor Law system has made an important contribution. Within recent years a more enlightened view of the care of old people and the chronic sick has been evolving; and, at the present time, there is a stirring of the public health conscience concerning the previous neglect of those problems. All this is reflected in the increased interest by many organizations and the establishment of important research groups for the medical and social study of the aging population.

The mental services in the past shared with others the handicap of dealing only with well established diseases. Psychological medicine received a great impetus during the recent war, and the experience gained in both the grading and the assessment of mental aptitude and in treatment will, it is hoped, be translated into practice in civilian life. The influence of mental conditions on the causation or aggravation of bodily illness is now being scientifically investigated. The adverse effect of misfitting the man to the job is realized; and no doubt the newer methods of analysis will in time be used more and more in selection for employment. The boundaries between neurosis and disease of known structural pathological change are being explored and may lead to a clearer comprehension of many of the causes of disability and breakdown.

An almost intractable problem which

courses through our preventive and curative services, more intensive in the fields of tuberculosis, mental health, and chronic sick, is that of providing nurses. Recently a special group of investigators has inquired into this complex matter on behalf of the government, and their report * is awaited with intense interest by all concerned in the operation of the health services.

As regards the social provision against breakdown and accident, there have been enacted within the past year the National Insurance Act and the National Insurance (Industrial Injuries) Act. These two provide for insurance against sickness, unemployment, and injury.

Housing, of course, maintains its eminence as a public health problem, but economic factors are inhibiting progress. One recent development, however, is the advent of the New Towns Act which aims at the development of new areas rather than the extension of existing population overgrowths. In such an industrial country as ours—for example, in Scotland, four-fifths of the population live on one-quarter of the country's area—a spreading out of inhabitants is a prime public health measure.

The feeding of the nation during the war was, of course, the province of the Ministry of Food, and the activities of that ministry have succeeded in maintaining an equitable distribution of food among all classes. The distribution has been carried out with due attention to the qualities of the nutrients required and to the quantities needed by various sections of the community. Thus, the interests of the young and the factory worker, have been safeguarded. The expectant and nursing mother has had secured to her the food that she needs. This is an important social experiment and has brought nutrition into a prominent place in administration. Its repercussions on health are apparent and no health policy in the future will neglect this most important subject.

Education has an important part to play. The young must be taught the rudiments of healthy living, and the schools have an important function in the health services in this respect. It is to them that we must look for the development of the correct attitude to health in the citizens of the future. The education authorities as well as the health departments have had laid upon them the duty of safeguarding the health and insuring the treatment of school children; so there is a double check on the welfare of this important population group.

Thus in the health field we have to consider the influence of several ministries, each of which has something important to contribute. The success or otherwise of their policies must be taken into full consideration in formulating future developments.

Apart from the environmental health services, we have at the moment organized personal services for the care of the young, the expectant mother, for certain diseases such as tuberculosis, infectious diseases, and a less organized service for cancer. Moreover, there is a partially organized service for health in industry and for curative medicine in hospital, and at home as regards the adult-working population. The aged and the chronic sick have been cared for to some extent and the other non-medical services which I have just mentioned, namely, social insurance and nutrition, have been developed.

But few, in Britain, will deny that our national health services have been developed in a piecemeal fashion. The new objective is to bring them together within a comprehensive health policy which takes into full consideration the changing medical outlook toward health and the prevention of disease and disability; the developing conception of

* Published September 11, 1947.

social medicine; the importance of psychological factors in disease; the close relationship between health and industrial efficiency; and the key position of health in any complete scheme of social security.

To achieve this objective an essential step is to train the personnel of the health services in accordance with the lines of that policy. Already a start has been made with medical students, undergraduate and postgraduate. The General Medical Council, the body charged with the responsibility for maintaining a satisfactory standard of medical education, has recently adjusted its educational program giving more attention to preventive medicine and to the social and psychological aspects of sickness and disability.

Now we are facing other developments designed to improve the existing services, to fill in the gaps and to keep a running audit of progress. The new National Health Service Acts—one for England and Wales and a separate one for Scotland—place on the Minister of Health for England and Wales and on the Secretary of State for Scotland the duty of providing a hospital and specialist service for all members of the community, also a general practitioner or family doctor service including dentistry, home nursing, and other adjuncts. The duty still remains with local authorities to provide the services of preventive medicine and health education as well as the original environmental health services. The hospital and specialist services are to be operated through a different organization from the family doctor service. Thus, there are three separate administrative units to be built up and the problem will be to keep them in harmony with one another. The problem of their integration is, of course, a real one, but since the danger of separation is recognized the necessary administrative measures for securing unified action and coöperation are being taken. We believe that the proposals in these Acts represent a bold and purposeful step forward. As health administration can never be static and as experience of the new arrangements emerges, further advances may be anticipated in the course of time.

These remarks contain a brief and necessarily incomplete survey of the changing scene in British public health, yet they may serve to show how we are wrestling with the current problems and how we are endeavoring to face the future.

The Health Officer in Post-war Britain*

SIR ALLEN DALEY, M.D., F.R.C.P., D.P.H., K.H.P.
Medical Officer of Health, County of London, England, and President, Society of Medical Officers of Health

WHILE we are celebrating here the 75th anniversary of your Association, I bring to you the greetings and cordial good wishes of the Society of Medical Officers of Health of Great Britain—an institution now 90 years old.

I believe that this country appointed health officers long before we did in Great Britain. In fact, it was only in 1847 that the first medical officer of health was appointed in England—Dr. Duncan, of Liverpool—and the second, appointed by the City of London in 1848, was the famous Dr. (afterward Sir John) Simon, whose writings will be well known to most of you.

I will not weary you with an account of the progressive development of the British Public Health Service. Suffice it to say that it was born to cope with cholera, smallpox, and typhus fevers, and with gross insanitary conditions. During the past forty years its activities have extended more and more into the field of the personal health services, and hospital care and management have been major responsibilities during recent years.

The Coalition Government produced a plan for integrating voluntary and municipal hospitals on the basis of a local government service. The voluntary hospitals would have retained their status but would have been subject to an overall plan as to uses and would have been heavily subsidized by public money. The new government brought out early in 1946 a revised scheme which has now been approved by Parliament and within a few months will be implemented. The basis of the scheme, as was that of the Coalition, is a comprehensive medical service free to all at the time of need, though the universal National Insurance Scheme with which it is linked requires weekly contributions from every family. The transfer from Insurance Funds will, however, meet only about a quarter of the total cost of the Health Scheme. There are three pillars of the scheme, but the medical officer of health has direct concern with only one of them.

The first pillar is the hospital and specialist service. At present the local authorities provide a hospital service but there are in most areas a number of voluntary hospitals as well. In London, the municipality provides over 70,000 hospital beds and the number of beds in voluntary hospitals occupied by Londoners is under 20,000. In the new scheme, all hospitals except those run for private profit, are to be taken over by the Central Government. This has certain advantages. Competition and rivalry between municipal and voluntary hospitals will disappear and there will no longer be vexatious limitations on the admission of patients which in a

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.

scheme based on local government must depend on where they happen to live.

It is also recognized that a comprehensive hospital service must be based on a large area. It is generally agreed that a population of some two million inhabitants at least is needed and, except for London and possibly Middlesex, no individual local authority area contains a sufficient population. The government has realized the risk of overcentralized bureaucratic control and has devised a system of decentralization which, so far, is unique in the administration of a public service. The country is divided for hospital purposes into fourteen regions. Each will be in charge of a regional hospital board nominated by the Minister from names suggested by the universities, the teaching hospitals, the doctors, the local authorities, and those now administering voluntary hospitals. They, in turn, will devolve the day-to-day management to local hospital management committees each responsible for about 1,000 beds in one hospital or in a group of hospitals.

Financial control must dominate the situation, and success or failure, contentment or discontentment of the staffs will depend largely on its looseness or tightness and how control is effected. The velvet glove is essential in a service such as this. All specialists will have a hospital attachment, and the regional hospital boards will be responsible for the specialist service which is, under the scheme, to be available for domiciliary consultations.

The taking of hospitals out of local government means that medical officers of health will lose their control of fever hospitals, which they have held since they were first built seventy to eighty years ago, and also of tuberculosis sanatoria, which they have had for over thirty years. It has also reversed the policy of the past twenty years, which has been directed toward building up all the local medical services under the same administration, that is, the major local authority and its medical officer of health.

Another of the three pillars of the new service—the general practitioner service—never has been in the local public health departments except for the domiciliary treatment of the destitute sick under the Poor Law Acts. The new provision of a general practitioner service available for all is a natural development of medical benefit under the National Health Insurance system which started in 1913. The local administration of that service has been the responsibility of the local insurance committees. There is one for each major local authority and the local authority itself has a small representation upon it. The organized medical profession has always fought against domination or any form of control by local authorities and hence their insistence in 1912 that the local insurance committees, though covering the same areas, should be completely independent of the local health authority and, incidentally, of its medical officer of health. The medical profession has representatives on these insurance committees which receive advice, therefore, on medical matters from them. The new councils to be responsible for the general practitioner (and the dental) services are to cover, as did the insurance committees under the National Health Insurance Act, the same areas as those of the major health authorities, but the representation of the health authorities is to be strengthened, being one-third of the total. Unless, however, he is nominated to membership by his authority, the medical officer of health has no part in the work of these "executive councils." There is strong representation of the medical profession on these councils.

We now come to the third pillar. This is composed of the major health authorities, the counties and county boroughs renamed the local health authorities. The

local health authorities have many important duties in the new regime. Some are old duties, some new, and some which were formerly powers are now turned into duties.

At this stage I may point out that the new National Health Service Act makes no mention of the environmental health services—legislation concerning them remains unchanged. The duties of local health authorities are to provide a child welfare service (the Education Act of 1944 had placed on the major local authorities the duty of providing a school health service), a domiciliary midwifery service, a health visiting service, a home nursing service, an after-care service, and an ambulance service. Provision must also be made for immunization and vaccination. There is also power to provide a home help service. All the above, in some form or other, is a development of existing services. It is interesting to note that the methods to secure voluntary immunization against diphtheria have been so successful, and the laws for compulsory vaccination had been so weakened by the conscientious objection clause under which some 50 per cent sought and gained exemption, that the almost century-old Vaccination Acts have been repealed.

There is, however, one entirely new duty placed on the local health authority which may well be the seed from which a mightly tree will grow. This is the provision of health centers from which general practitioners will work in group practice. These centers are to be provided by the local health authorities, who will be responsible for the provision and maintenance of the fabric and for the non-medical personnel, including nurses and clerks. The doctors and dentists who work in these centers will, however, be employed and paid, not by the local health authorities, but by the executive councils. The conditions of service will be settled nationally by negotiation between the Ministry of Health and the professions. The extent to which doctors and dentists will be willing to work in health centers rather than in their private surgeries is by no means clear, and a serious administrative problem arises as to exactly where new health centers, which obviously must be on an experimental basis, should be located. New housing estates, to which new doctors will have to be imported, are an obvious first choice, but otherwise there is a considerable element of doubt whether the existing local doctors who join the new service will wish to use them. Health centers cannot be built, or even adapted from existing buildings, in a trice, and it will need much administrative skill to insure that the doctors who wish to work in a health center have one available when and where they need it, and, *per contra*, if a health center is provided first, that the local doctors and dentists will use it. I should add that these health centers will, we hope, be associated closely with the various other activities of public health departments and contain within the curtilage or in adjoining buildings maternity and child welfare and school clinics of various sorts.

To sum up the past, the trend was definitely to make the medical officer of health the chief administrator of all the health and hospital services in his area. He was becoming less and less concerned with the environmental services—all that was reasonably necessary had been done or the work was passing to expert technical hands, e.g., housing clearance areas are being dealt with on the reports of surveyors on town planning grounds rather than on the reports of medical officers of health on health grounds, the collection and disposal of household refuse is rightly being transferred from health departments to the engineer or often to a separate department of its own. The medical officer of health is still, of course, the watch-dog over the purity of the water supply and

on prevention of river pollution, but he has no technical responsibility for the engineering side. Sanitary inspectors are more highly educated than they were and are pressing to have independent commands. While these environmental services were occupying less and less of the time of the medical officer, the personal health and the hospital services needed more and more of his attention.

Another trend must be noted and that is recognition of the fact that responsibility for the administration of public health services must be in the hands of authorities sufficiently large to assure the financial resources necessary to do the work properly. Further, the child health and the school health authorities should be the same. This is leading to a transfer of certain services from the smaller to the larger authorities. Demonstrations of local civic pride and much heart burning have been noted in some of the areas from which functions are being transferred.

To revert to the health officers of the large authorities, the medical officer of health of a county borough or a county council will not only have responsibility for the important services entrusted to the local health authorities, some of which have been already listed, but, as the Minister of Health has recently said, he will be the bridge which joins the other two parts of the service—hospitals and family doctor service—to the health service. Opinions differ widely as to whether or not it is a good thing to put the hospital and health services under separate administration and so reverse the trend of recent years. The main justifications for the separation have already been touched upon. Others are that the increasing cost of hospitals would cast a heavy burden on local finance, and the reluctance of voluntary hospitals and the specialists who work in them to be subject to local government control. The arguments against that are that the health service depends on hospitals for much of its work, e.g., fever hospital beds, maternity beds, beds for cardiac rheumatism, and for the tuberculous. If the health officer could rely on getting his needs for hospital beds met on demand the question of which authority administered a hospital would not much matter, but as people who are hospital administrators now, we know that all demands cannot be met and the priorities given by a purely hospital administration if it has the last word may not be the same as would be given by a health officer controlling a hospital service. The answer to this may well be that the Ministry of Health and not the regional hospital boards will have the last word as to the disposal of beds, but intervention at this level would not be conductive to a happy relationship between the hospitals and the local health services.

Liaison committees of officers to try to solve the interlocking problems will, of course, be necessary, but the hard core of the matter is that the health officer will not be able, as he can now do, while he controls a hospital service, to *direct* that particular classes of patient must have priority in admission because it is of importance to the public health. A further point I may mention, which, no doubt, affects you too, is the increasing amount of time we have to spend in conferences and committees to the detriment of our executive and field work. As a result we have insufficient time for thought and calm reflection on matters of really high policy or on new projects for improving the public health.

The health officer of the future must have access to the basic facts of morbidity for his area if he is to do his job effectively. He now has information about mortality and about the notifiable infectious diseases, but he needs to know much more than that. He must have detailed information about the incidence of *all* the diseases which occur in his

area, and a vast field of research and of subsequent action would be opened if he had access to the records of the hospitals and of the general practitioners of his area. The new service for the first time gives an opportunity for this. But the health officer must have not just the gross figures for a large area. He must be in a position to have access to the *detailed* facts so that he can analyze them in such a way as is likely to lead to conclusions from which action can be taken. For example, it will not be of great value for him to know that rheumatic diseases, neuroses, chest or gastric complaints are unduly prevalent in his area as a whole. He must be able to find out whether the incidence is general or localized to particular districts, to particular types of housing, or to workers in particular factories.

I mention this, despite what I said earlier about the severance of the hospital from the public health side, because we will now have all hospitals in the same service and a general practitioner service which all, men, women, and children, are entitled to use and which the vast majority will use. I trust that by good will on the part of all, such coöperation as I have indicated will enable this important information to be available. I envisage that in the future the public health officer will be regarded as a friend and colleague by those working on the curative side. I remember the days when general practitioners were critical of the public health departments' clinic services. Those criticisms are now heard seldom, but one hopes they will disappear entirely when, for the great mass of people, payment will be on a capitation or salary basis and not on a fee per consultation or attendance. The general practitioner health centers should bring the general practitioners and the health officers working there into a close and amicable relationship such as has never existed before.

One more point I may mention, and that is the development of the social welfare side of public health work. This is becoming increasingly important and covers a wide range: rehabilitation after accidents and serious illness, the fitting of the tuberculous, the crippled, the blind, and the deaf into the community in such a way that they are not a burden to themselves or to the community or, at the worst, that they are the least possible burden, etc. Medical advice and guidance for the planning and administration of this type of scheme are essential, but a question arises as to whether the whole administration need be under medical control. Our Poor Law system, dating from Elizabethan times, is being broken up. The payment of cash benefits will go to the State but much welfare work will remain with the local authorities. Should it be in the public health departments or should a separate social welfare department, parallel to the public health department, be established? and if the latter, what should the line of demarcation be? The views of public health officers and of those now engaged in the Poor Law and social welfare departments may well differ on this matter.

I have indicated some of the problems about which we are thinking on the eve of a radical change in the British public health system. It is clear that new and enlarged spheres of work are unfolding and we must be prepared to grasp and develop them. One general principle which emerges from my presentation of the new scheme is to emphasize that under it the treatment of disease either by specialists or by general practitioners is to be outside the purview and responsibility of the health officer. It is argued by many that this is sound and that better preventive work will be done if the health officer concentrates all his energies on prevention. This may be so, but prevention of serious disease often means looking for the early case and get-

ting it treated in hospital or otherwise. The new conception of social medicine means instilling the idea of prevention of future breakdowns in health into the hospital staffs and general practitioners, and making them conscious of the importance of domestic, economic, industrial, and environmental factors. Are they more or less likely to absorb these ideas if the preventive side is under a separate authority? Time alone will show. It is perfectly certain, however, that with the relatively high cash benefits to be given under the new insurance scheme and with the ever rising costs of hospital treatment every effort will have to be made to prevent ill-health, and there is no doubt that the importance of the health officer will be increasingly recognized.

The scheme is a courageous attempt to provide a really comprehensive health and treatment service freely available to all. No doubt modifications and changes will be needed as the result of experience. Medical officers of health have been critical of the scheme and some only of their criticisms have been met, but I can assure you that they will play their part ungrudgingly in what is both a conception on the grand scale and a great experiment. They believe that they have sufficient power and influence to insure that the preventive idea will eventually permeate the whole of the medical services of the country and that the triumphs of the past will be repeated in the future.

I have set out these various points because in every country there is a movement to provide. at varying speeds, a better public medical service, and the problems which in Britain confront us today may equally be yours in a few years' time. By then, we in Britain can tell you how our scheme has worked, what are its weaknesses and what is its strength.

Training of Sanitary Inspectors

The New York State-Rensselaer County Public Health Training Center at Troy is conducting a 12 week course for sanitary inspectors in coöperation with the U. S. Public Health Service. The course is designed as practical instruction for apprentice sanitary inspectors and as a refresher for qualified personnel. There are no tuition fees and the local health departments whose workers are being trained are expected to furnish transportation and maintenance for their workers in addition to regular salaries. The course is limited to 12 workers from New York State local health departments.

Additional courses of about 15 persons are planned for May and September. For these courses about one-third of the students will be accepted from other states. For application forms and details apply to New York State-Rensselaer County Public Health Training Center, Rensselaer County Health Department, 7th Avenue and State St., Troy, N. Y.

The Coördination and Integration of the Public Health Program*

HENRY F. VAUGHAN, Dr.P.H., F.A.P.H.A.
Dean, School of Public Health, University of Michigan, Ann Arbor, Mich.

THE success of a public health program is largely dependent upon good team work engendered by all who participate in the promotion of personal health and the integration of the individual's well-being into the collective entity which we call public health. Many are the facets in the training and experience of the members of this public health team. We are not limited to representation from the official health agency but we serve the voluntary associations, the cultural and educational organizations, the physicians, dentists, and veterinarians in private practice, and, indeed, we represent large segments of the very public which we aim to serve. In spite of this diversification in our professional background which one finds reflected in opinions, attitudes, and patterns of approach to health matters, there is a common thread which binds together our interests in the field of public health. This bond which unites the members of the health department staff and impinges smartly on the responsibilities and functions of the medical health officer, the public health nurse, the health education specialist, the public health engineer, and veterinarian, is health education. Through health education, personal health becomes integrated into public health and the latent interest of the individual becomes the effective participation of the masses.

Health is a living entity influencing the behavior and habits of those who must participate in its attainments if we are to enjoy maximum freedom from disease and accident. Society demands security against the unnecessary illnesses and accidents which impose physical and mental impediments upon people at every age and of every social and economic level, depriving them of the normal, useful, and gainful lives to which a free and democratic nation is entitled. Health is definitely a purchasable commodity, as essential to man's well-being as food, fuel, shelter and clothing. But health education is only a catalyzer which provokes and encourages personal and public participation.

Fundamentally, we must begin with a philosophy for our public health program and include in its structure those elements which make it a complete entity. Before we can coördinate and integrate the program, we must have sound basic data and factual information to serve as a foundation. Identification of such data for community health planning is provided by (1) morbidity and accident statistics, (2) mortality statistics, (3) birth, marriage, and population records, (4) special surveys, and (5) the official records of the health departments, visiting nurse associations, voluntary health agencies, the schools and other organizations. Accuracy in such statistical data provides a reliable and nutritious medium upon which to implant the careful analyses of our bio-

* Presented at a Joint Session of the Public Health Veterinarians and the Health Officers, Public Health Nursing, and Public Health Education Sections, of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 6, 1947.

statisticians from which we harvest plans which direct our programs in public health administration and health education. To operate such plans successfully and efficiently, we require health facilities which are available and within the financial reach of all people. Thus, we complete the fabric of our health program by including (1) basic data, (2) facilities, and (3) economic considerations, and by binding these together with (4) health education.

Let us examine for a moment some of the needed facilities. In order to provide full expression for the sanitary and medical programs and thus profit by the art of public health practice, there is needed for each local area within the United States a city, county, or district health department, organized on a whole-time basis and providing as a minimum the six basic health functions emphasized by Emerson [1]—(1) vital statistics, (2) control of communicable disease, (3) environmental sanitation, (4) public health laboratory service, (5) infant and child health services, and (6) health education for the general public. Support for such a local health department will continue only if the health director develops a sound public appreciation of what the department is doing for its constituents. This confidence must be built around the department, upon all of the employees and their services, and not focused on the personal ambitions of the director or any other single member of the staff. When inquiry was made of a distinguished state health commissioner as to what he ascribed his long tenure of office, he replied promptly that it was due to his policy of developing a public appreciation of the work of his staff and coworkers that he had become recognized as the head of a state department which was giving adequate professional service to the people of his commonwealth.

Because of its professional character, the health department like the department of education becomes one of the most expensive services of local government. The health director and the members of his staff should be among the best paid public officials. Unlike the usual run of political office seekers, these are highly trained and skilled professional men and women who have devoted years to specialized training and who undertake their responsibilities on a career basis. The health department needs should be expressed in the basic budget provided through the tax resources of the city, county, or district. To this basic budget there may be entered as a credit allotment from state and federal sources. However, a securely established local budget as a nucleus for the maintenance of the health department with promise of continued public support becomes the *sine qua non* of a good department. Return must be made on money that the public invests in the health service, returns in service, illness and accidents prevented, deaths postponed, health knowledge and understanding extended. Failure on the part of the health director to report appreciable service and results invariably means a shrinkage in appropriation and ultimately the disappearance of the health department itself. Team work in the dissemination of health knowledge by all professional members of the health department staff is the key to good service and adequacy in the health program. The physician, dentist, engineer, nurse, and health education specialist must work together on a coördinated program omitting no opportunity to stimulate public understanding and participation.

The Emerson report [1] recommends that "for a community of 50,000 persons there will be needed one full-time professionally trained and experienced medical officer of health, a full-time public health or sanitary engineer, and a sanitarian of non-professional grade,

ten public health nurses, one of whom would be of supervisory grade, and three persons for clerical work." It is further expected that part-time medical and dental assistance will be sought and that the state health department will provide certain consultant and advisory services in health education and other fields. For populations of larger size, proportionate increases in personnel will be required, with provision for other specialists in the medical, laboratory, dental, nutrition, and health education fields. These suggestions are intended to serve only as a guide for the average community and represent the bare minimum for acceptable practice.

In providing the staff for a local health department, one must give consideration to both quantity and quality of personnel. The various *Appraisal Forms* developed by the Committee on Administrative Practice of the American Public Health Association have emphasized quantity although quality has not been altogether overlooked. In the newer *Evaluation Schedule* an attempt has been made to emphasize both. They seem interdependent. The quantity of service is dependent upon (1) the extent and character of the problem, (2) the unit of time for the service, and (3) the frequency of service. Generally, only a complete local survey of the community can provide the answer regarding the extent of the problem. In this connection the *Evaluation Schedule* has been most helpful, and provides a standard for comparisons between communities and within the same area in point of time. The quality of service can be safeguarded by the establishment of standards for education and experience by the employing agencies. Standards suggested by the Committee on Professional Education of the American Public Health Association are increasingly used by civil service and other merit systems, and may well be made a condition of grants to local health units by state health departments and the federal government.

In the health department there is no conflict between the interests of the health education specialist and the public health nurse. The former deals in broad community relationships and serves as staff adviser to the latter. The specialist, who should be basically trained in the biological sciences and education is (1) a member of a team working with the staff, (2) planning health education programs for all divisions of the department, (3) sharing skills and techniques, (4) assisting in staff education, (5) employing in her community program such tools as meetings, groups, radio, visual aids, newspapers, bulletins, etc., (6) integrating health education into programs of community agencies, (7) coöperating with physicians, dentists, veterinarians, and other professional groups, (8) coöperating with the schools, and (9) helping people in the community assume their responsibility in health matters. The principal tools are (a) the printed word, (b) the spoken word, and (c) visual education. The public health nurse carries the educational program more intimately into the household and by performance, aid, and demonstration activates the participation of those whose behavior it is intended to influence. And why limit this educational function to these two groups? It is the function of the health director himself, the specialist in environmental health, the clerk in the office, the telephone operator, and information clerk. And why limit ourselves to the health department personnel? Widen our facilities to include the representatives of the voluntary agencies, the physicians and dentists in private practice, the school teachers and, in fact, all groups which admit an interest in the furtherance of personal health and the conservation of public health.

Illnesses and accidents, hindrances to positive and wholesome health, con-

stitute a people's plague, and coöperation and participation of all is essential to the fulfillment of our health program. Coördination and integration must become embedded in the philosophy and actions of the public health team extending from the commissioner's office to every office and service in the department and reaching out to coöpt the latent resources of other groups, agencies, and individuals which can be harnessed to the goal of better health.

REFERENCE

1. Emerson, Haven, *Local Health Units for the Nation*, The Commonwealth Fund, 1945.

Training Resolution of the Association of State and Territorial Health Officers

The following resolution was adopted by the Association of State and Territorial Health Officers at its annual meeting in Washington in December:

WHEREAS, the Committee on Professional Education of the American Public Health Association, after considerable study, has set standards for certain technical and professional public health personnel, and whereas this committee plans to set standards for as many categories of public health positions as is practical, and

WHEREAS, schools of public health and other organizations are presently training a number of technical and professional public health personnel, and

WHEREAS, there is need for raising personnel standards in various health departments of the nation, be it

RESOLVED that the Association of State and Territorial Health Officers recognize the desirability of adherence to the standards for technical and professional public health presonnel recommended by the Committee on Professional Education of the American Public Health Association by organizations employing public health personnel and the desirability that schools of public health and other organizations offering training in the field of public health aim their training programs towards these standards.

Graduate Training of Engineers in Public Health*

JOHN M. HENDERSON, C.E., F.A.P.H.A.

Professor of Sanitary Science, Columbia University School of Public Health, New York, N. Y.

DURING the first third of this century, several diseases of insanitation were so prevalent in this country that the activities of health departments in environmental sanitation were confined largely to their control. Measured by sheer incidence, these may be considered as: the environmental enteric infections, malaria, and hookworm disease. The scope of control activities was narrowed still further by other forces. The enteric diseases were national in extent and thus received more attention than the regional problems even though at times these—malaria, hookworm, etc.—might have been greater. The attack against the enteric infections was further concentrated against those modes of transmission which were most amenable to control. The epidemic situation attracted more attention than the endemic, although the latter often was greater. The sanitation of cities took precedence over that of rural areas. The resultant effect was to give greatest prominence to the fields of municipal water and sewage, including their treatment aspects.

Another characteristic of past practice was the concentration of public health engineering services in state, rather than local, health departments. This still further encouraged the narrowing of interest in sanitary matters and clinched the case for the water supply and sewerage fields. The scope of state services was confined largely not only to urban problems, but more particularly to those municipal utilities for which local managerial services were available. Moreover, the pattern of state office service encouraged specialization by the individual within these limited fields.

The character and scope of graduate training available to public health engineers during that period largely reflected these conditions. Since there was little distinction at first between the work of the engineer in the embryonic bureau of sanitation of the state health department and that of his colleague in private practice, training for public health engineering was accomplished by admitting the student to existing courses which had been designed for those preparing for private practice or research.

The nation-wide incidence of the environmental diseases cited has now fallen to a comparatively negligible level, due to the influence of sanitary and other public health activities, and economic, biologic, and sociologic change in various complex combinations. This near-disappearance of old enemies has been accompanied by the acquisition of new knowledge in the control of what were viewed formerly as lesser disease problems, by rising standards of living, and by increased public demand for governmental services in public health, including those leading toward the better-

* Presented before the Engineering Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

ment of health and freedom from obnoxious nuisances. These and other factors have given impetus to expansion in local health service, both in geographic extent and in adequacy of service rendered.

The resultant effect on public health engineering has been twofold. First, present indications are that the majority of future openings for public health engineers will be in local health services—with cities, counties, and small districts. Second, the scope of public health engineering is broadening. The engineer in local health service is faced with problems in many fields, all possessing a nearly-equal level of significance. Many of these men also must possess ability in executive direction, planning, and administration.

In terms of graduate training, the need for more comprehensive instruction has been recognized in some quarters. One manifestation has been an expanded interest in field training for engineers as a supplement to graduate academic instruction. Recent steps by the U. S. Public Health Service toward the development of a number of regional field training centers are commendable. It is hoped that full advantage will be taken of these and other competently managed field facilities by engineers upon completion of their graduate academic studies.

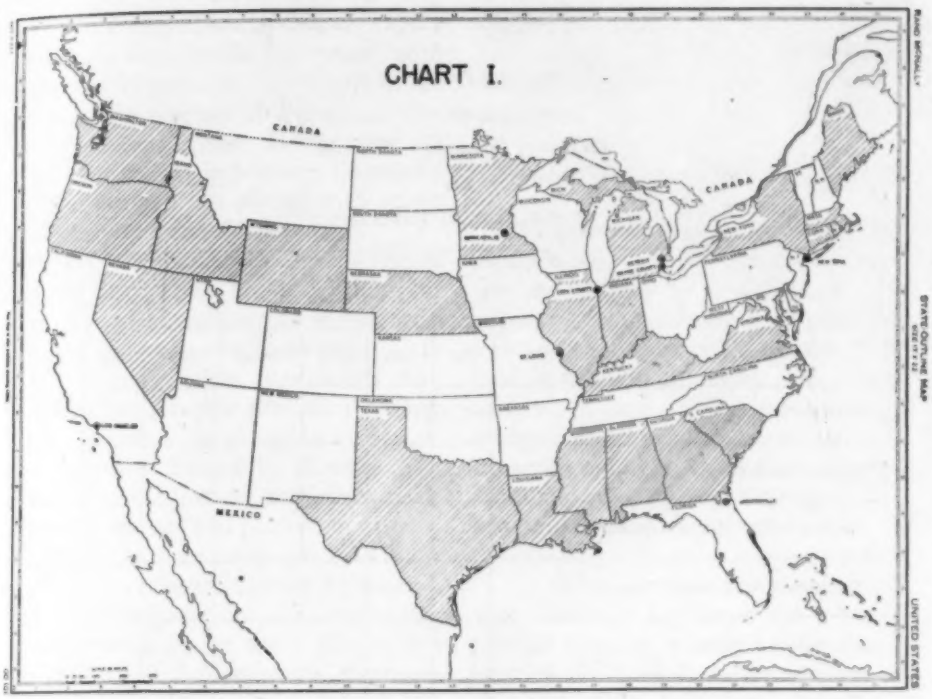
In graduate academic training, the pattern of courses described in the recent report of the Committee on Professional Education (*A.J.P.H.*)[1] represents in outline the curriculum offered by those schools which recognize the need for comprehensive programs of study. In some, the indicated coverage of principles of public health, principles of sanitary science, and of applied engineering sciences, has been resolved into a curriculum which devotes half of one academic year to required subjects in sanitary science and public health, and the remaining half to a wide choice of advanced electives in sanitary fields.

In the design of such a curriculum, the opinions of supervising public health engineers attain special significance. These individuals, from experience acquired, should be qualified to indicate many of the graduate educational needs of subordinate personnel, and to evaluate the quality of such training by observation of the finished product. The opinions of members of this group may well be the most significant single consideration among the many which enter into curriculum design. This applies most particularly to optional programs of advanced study in the second half of the year.

In the fall of 1946, a request for opinion as to the importance of specified subjects was mailed by the author to the state health department directors of engineering bureaus or divisions of sanitation, and to the engineer-directors of 14 principal city or city-county health departments. The limited number of directors with local health departments who were circularized was due to decision to restrict the poll to those engineers who were known to be supervising other engineers and thus were in a position to make a more objective, and perhaps more complete, appraisal than personal experience alone might permit.

Replies were received from 23 state health departments and 8 local health departments. Submissions from many states represented the joint opinions of several senior members of the bureau or division. A majority had narrative comments appended; these were as significant as the completed forms. As will be seen from Chart I, a representative geographic distribution was obtained.

In order to collect more revealing data, many fields of sanitation and other subjects were subdivided into components; thus Milk Sanitation consisted of 8 line items, but it was explained that these would not constitute separate



subjects in the curriculum. In general, subjects of oldest standing in academic curricula were not subdivided to the same degree as were newer ones, since the former were more simply classifiable into commonly recognized elements. This procedure resulted in 89 line items, grouped into 16 sections. A sample of the form is shown in Chart II.

Aside from the minimum requirement of a B.S. degree in engineering, no other eligibility standards were set forth for the student for whom the course was to be designed. Additional specifications were deliberately omitted in view of the diversity of educational qualifications and experience possessed by students accepted for graduate training by different schools. The primary categories include the baccalaureate degree holder in engineering without public health experience, those with at least 3 years of experience as well, and those who also possess a previous graduate degree, with or without experience.

The replies received were summarized by several statistical procedures, and the remainder of this article is devoted to the presentation and discussion of results obtained under the main column heading *Importance in Curriculum* (see Chart II).

The popularity of line items was first measured by recording only votes posted in the sub-column *Essential*. Votes under the 4 sub-headings *Essential, Important, Desirable* and *Unimportant* were then weighted in the order 5, 3, 1, and 0, and the results for each line item were consolidated into a single score. Further weighting of these last results was then made for size of organization represented by the respondent, with weights of unity and 2 assigned respectively to organizations with under 10, and with 10 and over, engineers. Accordingly, 3 sets of results were obtained. When these were compared, a few minor differences in the popularity position of some line items were noted but, in gen-

CHART II

REQUEST FOR OPINION
ON
GRADUATE ACADEMIC TRAINING
OF
PUBLIC HEALTH ENGINEERS

Subject	*Importance in Curriculum*				*Intensity of Instruction*		
	Ess	*Imp*	*Des*	*Unimp*	*Thor*	*Sup*	*None*
General							
General Subjects							
Applied Public Health Education							
Elementary Bacteriology							
Elementary Biology							
Elementary Biostatistics							
Elementary Parasitology							
General Epidemiology							
Municipal Gov't & Finance							
Organic Chemistry							
.....	....	....	....	.....	.....	....	.....

Explanation of Abbreviations: Ess = Essential Des = Desirable
Imp = Important Unimp = Unimportant

eral, close agreement existed between the 3 sets of results. For this reason, data from only the middle procedure—*Weighting According to Degree of Essentiality,* are presented in the remainder of this article. These have been converted to a percentage scale, with 100 representing the highest possible score.

COMPARISON BETWEEN BASIC SCIENCE, APPLIED THEORETICAL, AND APPLIED TECHNICAL SUBJECTS

For simplification, this comparison ignores several other classes of subjects.

In general, the trend of responses was away from applied theory, i.e., intermediate subjects, toward the poles of basic science and practice.

This can be illustrated by comparing the most popular basic science course (bacteriology) with certain water supply subjects, since this was the most popular field of sanitation. The basic science subject of *Elementary Bacteriology* and the applied technico-administrative subject of *Public Health Super-*

vision and Inspection of Water Supply Systems were tied for first place, with a score of 96 per cent. By contrast, the intermediate subjects of *Review of Water Treatment Plant Design* and of *Water Laboratory in Sanitary Chemistry* were in 6th and 9th places, with scores of 79 per cent and 73 per cent.

The total number of 89 line items reduced themselves to 49 positions of rank, due to numerous tied scores, with the median position of 25 having a score of 55 per cent. While *Elementary Bacteriology* had a higher position than any other so-called basic science course, others ranked favorably. *General Epidemiology*, which many consider a basic science in the applied profession of public health, was in 13th place, with a score of 70 per cent. *Applied Epidemiology of Milk-borne Diseases* was 17th, with a score of 63 per cent. *Elementary Biology*, *Applied Elementary Entomology of Disease Transmitting Insects* and *Epidemiology of Murine Typhus* were at or slightly above the median, as was also *Hydrology*. *Elementary Parasitology* was slightly below the median. Although several of these subjects are applied in character, they possess a basic science significance when considered in a curriculum for public health engineers.

COMPARISON BETWEEN FIELDS OF SANITATION

The order of popularity of 17 fields of sanitation is shown in Table 1. This was determined by selecting the most popular line item subject in each field and assigning its position of rank to the field in which it belonged. The number of fields of sanitation as conventionally recognized is expanded; in part because the subjects Rural Sanitation and Plumbing were given separate status due to difficulty of placement.

MOST POPULAR SUBJECTS

In Table 2 are listed the 20 most popular subjects in order of position. As mentioned previously, some of these are elements rather than course entities.

COMPARISON BETWEEN STATE AND LOCAL RESPONSES

Due to the small size of the "Local Health Department" sample (8 replies),

TABLE 1

Comparison Between Fields of Sanitation

Field	Rank	Score, Per cent	Field	Rank	Score, Per cent
Water	1	96	Food (other than Milk and Shellfish)	9	71
Rural Sanitation	2	87	Excreta Sanitation	10	66
Sewerage and Sewage Treatment	3	84	Garbage and Refuse	11	61
Rodent Control	4	83	General Insect Control	12	59
Milk	5	74	Industrial Hygiene	13	55
Plumbing	6	73	Mosquito Control	14	53
Swimming Pools and Bathing Places	7	72	Air Sanitation	15	51
Stream Pollution	8	72	Housing	16	33
			Shellfish	17	33

TABLE 2

Twenty Most Popular Subjects by Order of Rank

1. Elementary Bacteriology
1. Water Supply Systems — P. H. Supervision of
2. Rural Sanitation
3. Sewage — Review of Treat. and Disp. Practices
4. Rat Proofing — Princ. and Prac.
5. Sewage Treat. — Op. Prac.
6. Sewage Treat. — Review of Design
6. Water Treat. — Review of Design
7. Water Treat. — Op. Practices
8. Milk Plant San. — Princ. and Prac.
8. Sewage Lab.
9. Plumbing
9. Water Lab. — San. Chem.
10. Industrial Wastes — Prin. of Disposal and Treatment
10. Swimming Pools — Stds., Practices and Epid.
10. Pasteurization — Op. Prac.
11. Insp. Food Handling Estab.
12. Stream Pollution Surveys — Procedures and Eval.
13. Insp. Food Producing Estab.
14. Excreta-borne Disease Control — Special San. Measures for D. and E.

TABLE 3

Comparison of Responses by States and Cities

States			*Cities*		
	Subject	*Score, Per cent*		*Subject*	*Score, Per cent*
1.	P. H. Super. and Insp. Water	94	1.	P. H. Super. and Insp. Water	100
2.	Element. Bacteriology	90	2.	Element. Bacteriology	90
3.	Oper. Prob. — Sewage Treatment Plants	88	3.	Rural Sanitation	90
4.	Rat Stoppage	88	4.	Swim. Pool San. — Disease Transmission	84
5.	Water Treat. — Review of Design	88	5.	Food Handling Estab.	80
6.	Sewage Treat. — Review of Design	86	6.	P. H. Administration	80
7.	Sewage Treat. — Op. Prac.	86	7.	General Epidemiology	78
8.	Rural Sanitation	86	8.	App. Epid. Food-borne Diseases	76
9.	Water Treat. — Op. Practices	86	9.	Food Producing Estab.	76
10.	Sewage Lab.	82	10.	Plumbing	76
11.	Water Lab.	82	11.	Princ. Prac. Milk Pl. San.	76
12.	Princ. Prac. Milk Pl. San.	76	12.	Munic. Gov't and Finance	74
13.	Industrial Waste Treat.	76	13.	Adm. Asp. Milk Shed San.	72
14.	Stream Poll'n Surveys	76	14.	Past. Plants — Op. Prac.	72
15.	Water Bact. Lab'y	76	15.	Diarrhea and Enteritis	70
16.	Plumbing	72	16.	Rat Stoppage	70
17.	Past. Plants — Op. Prac.	72	17.	Rev. Sewage Treat. Prac.	70
18.	Water Supply Systems	70	18.	Swimming Pool Des.	70
19.	General Epidemiology	68	19.	App. Epid. Murine Typhus	68
20.	Insp. Food Handl. Estab.	68	20.	Elementary Biology	66
21.	Stream Poll'n Lab'y	68	21.	Pres. Tech. Subjects	66
22.	Swim. Pool Epi.	68	22	Adm. Asp. Gen. Insect Con.	64

results may not be fully significant. Furthermore, rural areas were not represented; the responding units consisting of large cities or city-county departments in congested metropolitan areas. Table 3 lists the 20 most popular subjects, tabulated separately for state and local responses. (Twenty-two are listed, because 3 subjects are tied for 20th place).

The outstanding differences between the two lists are the greater spread of subject content, and the greater interest in administrative and so-called "public health" subjects, demonstrated by the local respondents. Considering the upper half of Table 3 first, *i.e., the first 11 subjects,* 8 subjects in the *State* list are in the fields of water and sewerage. Four of these are in design and laboratory phases. Only 4 general classifications are represented—*water, sewerage, basic science,* and *rodent control*—as compared with 6 in the *Local* list—*basic science, water, bathing, food, milk, and basic public health.*

The number of *water* and *sewerage* courses is reduced from 8 to 1 in the *Local* list. Three so-called public health courses are in the *Local* list, but none in the *State* list. These are: *General Epidemiology, Epidemiology of Food-borne Diseases* and *Public Health Administration.* The most popular field of sanitation in the *Local* list is *Food Sanitation,* which placed 3 subject elements in the first 11 items.

The differences cited above do not change appreciably when the entire 22 items are compared. The *Local* list is more comprehensive, more concerned with administration, epidemiologic principles, basic science and operating practices and less concerned with design and laboratory courses, even where these are of a review character.

Superficially, the marked differences in the two lists is surprising, since a letter accompanying the form requested its completion on a basis of training needs for all public health engineers supervised by the reporting office. Hence, state office reports presumably included the needs of many local engineers and

of district engineers engaged in local types of service. The principal explanation appears to be that many states even today do not yet have a fully developed program of local health service, while local populations in some others are too small to warrant establishing local engineering positions in significant numbers.

Which of the two lists offers the more fundamental training rests on the personal opinion, and in some cases prejudices, of the individual. It is apparent however, that state opinion tends toward the technician and the specialist, while local opinion favors training engineers to be technical administrators. That this division of opinion is far from being clear-cut however, may be illustrated by the following comment from one respondent who has directed a state bureau of engineering for the past 25 years:

"I think the right track is to endeavor to develop a course more suitable for the rank and file of public health engineers. I believe these men should have a broader training in general public health activities rather than too much specialization in a few phases of the profession. It has been my observation that certain men should have specialized training who will be on specialized phases of activities, but that the majority of the men in the average health department will be required to cover more than one field of activity. Particularly is this true of those men who will go into local health services."

REFERENCE

1. Proposed Report on the Educational Qualifications of Public Health Engineers, Committee on Professional Education. *A.J.P.H.*, 37, 1:34–40 (Jan.), 1947. (Adopted by Governing Council, March 1, 1947.)

Cutter Lecture at Harvard

The Harvard School of Public Health announces that William N. Pickles, M.D., Medical Officer of Health, Aysgarth Rural District, Yorkshire, England, will deliver the Cutter Lecture on Preventive Medicine, April 12, 1948, 5 p.m. in Amphitheatre D of the Harvard Medical School. His subject will be "Epidemiology in Country Practice."

The Cutter Lectures have been held since 1912, according to the terms of the will of Dr. John Clarence Cutter, of the class of 1877, which directed that they should be "free to the medical profession and to the press." In addition, medical and public health students and others interested are cordially invited to attend.

Bacteriological Studies of the Fort Loudoun Reservoir*

ROBERT N. CLARK, F.A.P.H.A., AND
F. W. KITTRELL, F.A.P.H.A.
Tennessee Valley Authority, Chattanooga, Tenn.

FORT Loudoun Reservoir is one of the nine TVA reservoirs in the main channel of the Tennessee River. It extends from Fort Loudoun Dam at river mile 602.3 to a point above Knoxville, the limits of which extend from mile 641 to 651. The accessibility of the reservoir to a large population center emphasizes its potentialities as a recreation area, so when a general study was made of the quality of the water in the reservoir, particular attention was given to bacteriological investigations. The present discussion deals almost solely with an analysis of the factors which influence the density of coliform organisms, and consequently which affect the suitability of water in different parts of the reservoir for bathing.

It is important to understand that the Tennessee River is formed by the confluence of the Holston and French Broad Rivers, immediately above Knoxville, and that there is a deep storage reservoir on each of these two tributaries impounded by Cherokee Dam 52 miles above the mouth of the Holston, and Douglas Dam 32 miles above the mouth of the French Broad. During the bathing season the water passing both of these dams is drawn from the bottoms of the reservoirs through the turbines and is consequently very cold. Cherokee and Douglas Reservoirs provide storage capacity enough to protect the streams below the dams from the effects of upstream pollution. Below Cherokee Dam, the Holston River receives septic tank effluent from a sewered population of 2,500 at Mascot, Tenn., and raw sewage from the Burlington section of Knoxville, with a sewered population of 5,300. Below Douglas Dam, the French Broad River receives raw sewage through the Little Pigeon River from Sevierville, Tenn., with a sewered population of 460. At Knoxville, raw sewage is discharged into the reservoir from a population, exclusive of the Burlington section, of 86,800. The effluent of a primary sewage treatment plant from Maryville, with a sewered population of 5,800, and the effluent from a secondary treatment plant at Alcoa with a sewered population of 4,600, enter the reservoir through Pistol Creek and Little River. All sewered population data are of 1940, and the loads were doubtless greater in 1944 when the reservoir study was made.

Sampling stations were chosen with two purposes in mind, first to reveal the quality of water adjacent to potential swimming areas, second to show the course of bacterial pollution in the main channel of the reservoir. Accordingly, 21 stations were chosen along the shoreline, some on the main reservoir and some on embayments, and 14 stations were established in the main channel. Three of the latter were above Knox-

* Presented at a Joint Session of the Conference of Municipal Public Health Engineers and the Engineering Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 6, 1947.

ville, 2 were within the city limits, and the remaining 9 were spaced at intervals of about 5 miles downstream to Fort Loudoun Dam. Sample collections were made by boat. The swimming area samples were all collected from a single point at the surface. Main channel samples were collected at 3 points equally spaced across the reservoir. From June 28 to July 19, all channel samples were taken from the surface, and from then until October 2 all channel stations were sampled at mid-depth. Surface samples were collected in sterile bottles at a depth of 4 to 6 inches below the surface, with a forward scooping motion. Depth samples were collected in a device that permitted opening and closing the sample bottle at any desired depth. All samples were iced from the time of collection until delivery to the laboratory. The maximum time between sample collection and the start of bacteriological examination rarely exceeded 6 hours.

Laboratory examinations were made in accordance with *Standard Methods for the Examination of Water and Sewage*. Four tubes of each of at least 4 dilutions were inoculated in lactose broth. The presumptive tests were confirmed by transfer to brilliant green bile tubes from all 4 lactose tubes of the highest dilution in which all tubes showed gas, plus any tubes in higher dilutions showing gas. The three samples from the quarter points of each channel station were composited in equal portions in the laboratory, and examination was made of the composite sample.

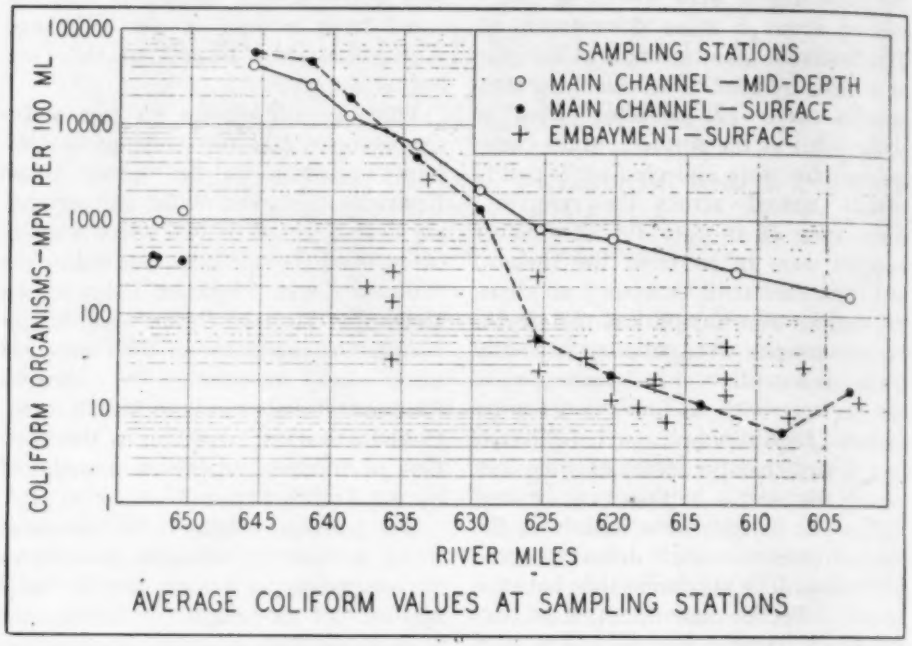
An essential part of the study was the correlation of hydraulic data with the sampling schedules. Times of water travel between stations were computed from observations of stream discharge and channel measurements, with due consideration of stratification, temperature, and reservoir operation, as well as the effect of other natural phenomena, and the times were field-checked by chemical methods. Stream discharge data and reservoir elevations were secured from records of the TVA and Water Resources Branch of the Geological Survey.

Valuable information on raw water temperatures and the densities of coliform organisms in the water above Knoxville, compiled daily and extending over a period of two years, was secured from the operation reports of the Williams Creek Filtration Plant of the Knoxville Electric Power and Water Board. Records prior to 1943 were not used, since impoundage of Douglas Reservoir in February and March, 1943, caused a marked reduction in the numbers of coliform organisms contributed by the French Broad River.

The principal factors to be considered in an analysis of coliform densities at various points in a river are the total number of organisms reaching the stream, the rate at which such organisms are reduced, and the time of water travel between the points in question. Other elements to be considered in Fort Loudoun Reservoir are variations at different points in a single cross-section, effects of side pollution, rainfall, wave action, density currents, and diffusion in embayments, and stratification.

The concentration of coliform organisms at river mile 645.5, which is about 1.7 miles below the center of gravity of sewage discharge from Knoxville, depends upon the number of organisms in the water above Knoxville, the number of organisms contributed by Knoxville sewage, and the dilution afforded by the river discharge. Records of the water plant were investigated for the May through September periods of 1943 and 1944, and the data obtained were correlated with stream discharge data. It was found that the total number of organisms carried past the water works intake each day was almost constant. Assuming a constant daily contribution from Knoxville sewage, this means that

FIGURE 1—Average Coliform Values at Sampling Stations



for practical purposes the total number of coliforms passing mile 645.5 may be considered constant, and the coliform density may be considered inversely proportional to the river discharge. It was found that the average number of coliforms in the river above Knoxville was 0.228×10^{15}, and at mile 645.5 it was 7.563×10^{15}.

A comparison was made of observed data on coliform densities in main channel samples between those collected at the surface and those at mid-depth, also with surface samples collected along the shore and in embayments. This comparison is shown in Figure 1. Sampling points in embayments are plotted against the river mile at the mouth of the embayment. On this figure, the coliform values obtained on samples other than from the river channel indicate consistently low concentrations. In only one case the MPN per 100 ml. exceed 300, and that was a point at mile 633.3 on the exposed right bank of the main river.

An analysis of the two curves plotted for surface samples and for mid-depth samples from the channel stations reveals an important relationship. From Knoxville downstream to about mile 630, the coliform densities at the surface and at mid-depth are in quite close agreement. Below this point, however, there occurs a sudden and wide divergence with a much lower density of organisms at the surface than at mid-depth. This is explained by stratification in the reservoir. An idealized diagram of this condition is shown in Figure 2. It has been noted previously that releases from Cherokee and Douglas Reservoirs are at very low temperatures, and during the summer when surface temperatures in Fort Loudoun Reservoir are comparatively high, the denser cold water flows along the bottom, leaving the surface stratum relatively undis-

turbed. During the period from May through July, the temperature difference between the epilimnion and the hypolimnion remained fairly constant at about 8° C. In August, the difference dropped to about 5°C. and in September to about 2° C. There was a definite tendency in the stratified section for coliform densities at the surface to exceed average values during the latter part of August and in September. This may have been due in part to wind action, since available records indicate more wind movement during this period. It is believed that the lower temperature differentials, which reduce the sharpness of stratifications, were responsible for most of the observed tendency.

Numerous field observations revealed that during the summer the cold water from upstream occupies the entire cross-section of the reservoir at Knoxville and for a variable distance downstream. Under various combinations of density and discharge, the flowing water does not require the entire cross-section of the channel near the lower end of the reservoir, and leaves the surface stratum undisturbed. Increased discharge rates cause the flowing water to occupy correspondingly larger portions of the cross-section and, in effect, force the upper end of the zone of stratification downstream. A decrease in the temperature differential between the surface and bottom has an equivalent effect. As these factors vary, the quiescent, and relatively unpolluted epilimnion may expand, contract, or disappear altogether. It is estimated that with the temperature differentials prevailing during the summer, the epilimnion will be completely eliminated by discharges in May through July of 28,000 cubic feet per second (c.f.s.), in August of 24,000 c.f.s., and in September of 17,000 c.f.s.

By similar analysis, the location of the upper end of the stratified section can be estimated for any condition of discharge and temperature. It may be expected that the coliform densities in surface samples collected upstream from

FIGURE 2—Diagram of Stratification

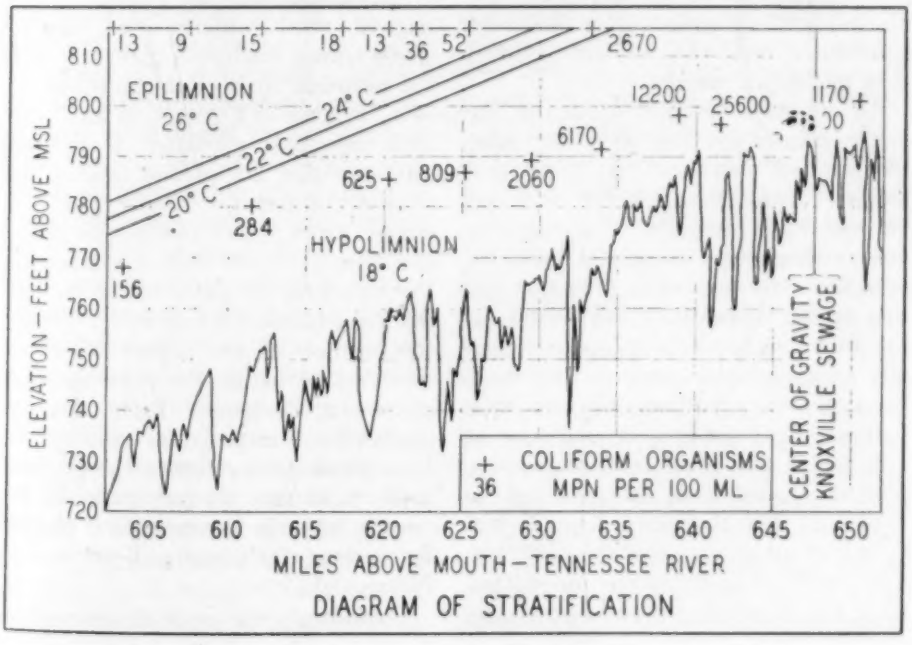
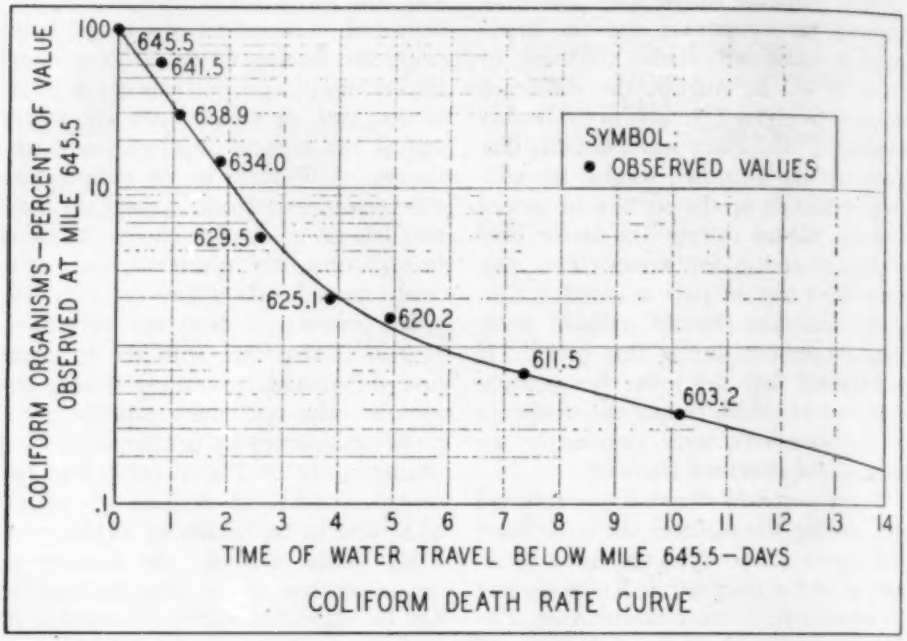


FIGURE 3—Coliform Organism Death Rate Curve



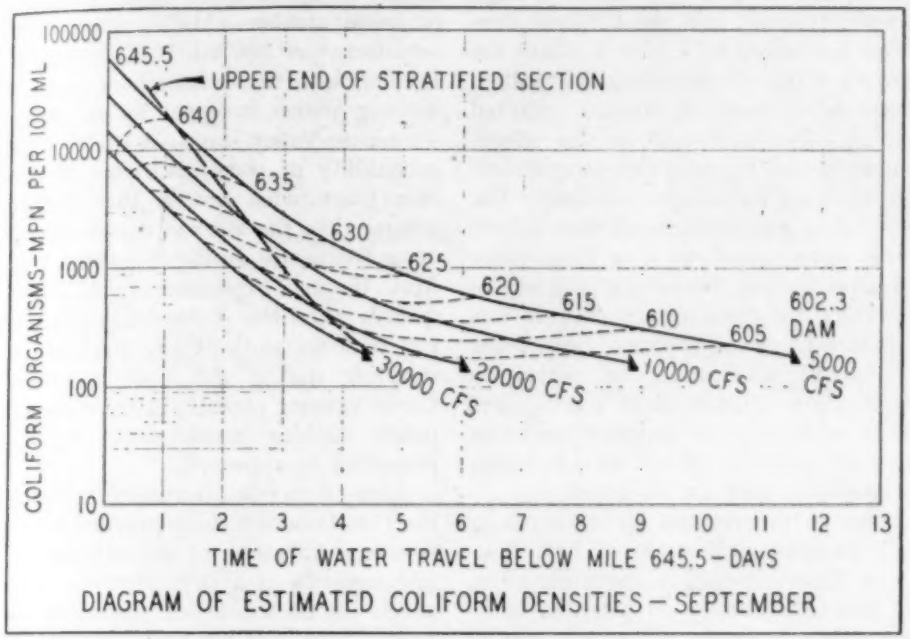
the stratified zone will be of the same order as samples collected at mid-depth, but that surface samples collected from points downstream from the upper limit of the stratified zone will be from the epilimnion, and will be less polluted than mid-depth samples.

An investigation was made of the death rates of coliform organisms using the method described by Frost and Streeter [1] applied to the data obtained on mid-depth samples. The times of water travel were computed for each sampling date and each sampling station by the Hydraulic Data Division of the TVA, and are believed to be unusually accurate for a study of this kind. Data on average coliform densities were reduced to percentages of the value at mile 645.5, and these percentages were plotted against time as indicated in Figure 3. The theoretical formula was computed as $y = 96.8\ (10^{-0.5158x}) + 3.20\ (10^{-0.0912x})$. Using the derived formula, the expected coliform density after any given period can be computed as water travels downstream from Knoxville.

An evaluation of these factors, namely, total coliform load, time of water travel, discharge, and position of the upstream limit of the stratified section, is shown in Figure 4, in which coliform densities, estimated from death rate formulae, are plotted against time of water travel for several river discharge rates. Also plotted, in dotted lines, are the river miles corresponding to given time of water travel for each discharge rate below mile 645.5 Finally, the location of the upper end of the stratified section is plotted for each rate of stream discharge. From this and similar charts prepared for other months, it is possible to estimate the probable coliform density at any point in the moving water in the main river channel for various discharges and temperature differentials.

Some study was made of observations

FIGURE 4—Diagram of Estimated Coliform Densities, September



on embayment stations to determine what correlations might exist between coliform numbers and distances away from the main river channel. It was found that above the limits of the stratified zone, all embayment samples showed significantly lower coliform numbers than were found in the channel. In the stratified zone, the coliform densities at the surface were about the same in the epilimnion and in the embayment, with a definite trend toward higher numbers at stations more distant from the channel. This may be due to the increasing effect of shore pollution as the cross-section of the embayment decreases toward its head, or it is more likely due to the effect of density currents. Such currents were not measured during this study, but have been observed under similar conditions to flow up an embayment on the bottom and down the embayment in a surface counter-current. The phenomenon is due to surface warming, with consequent changes in water density.

The effect of rainfall and surface wash was also examined by grouping data by ranges in rainfall of 0.1 to 0.30, 0.31 to 0.60, and over 0.60 inch, and also by the number of days the sampling dates followed rainfall. No effect was observed from rainstorms of 0.60 or less; but, following higher rainfalls, the coliform values exceeded the average on the day of precipitation and for one day following. These conclusions are based on a summary of data from all stations, since the data available from a single station were not adequate to justify a correlation. One storm of unusual magnitude occurred at the end of September throughout the reservoir drainage area. Seven rain-gage stations in the vicinity of the reservoir reported total rainfalls for the two day storm ranging from 5.14 to 8.80 inches, with an average for the seven stations of 6.56

inches. On October 2, two days after the storm, samples were collected from several stations, and the coliform densities are shown in Figure 5 where the results of this one sampling are plotted, with the average of samples collected on all other days. All of the results shown in this figure are on samples collected from embayment stations. The possibility was investigated that factors other than run-off, such as disturbance of stratification, may have exerted an influence on these results, but it was concluded that the abnormal run-off was the principal cause of the excessively high values. This incident is recognized as an example of the degree of pollution to which even the best of surface waters occasionally may be subjected.

One of the reasons for undertaking the bacteriological study of Fort Loudoun Reservoir was to assess the effect of Knoxville sewage on potential bathing areas. Since the pollution is clearly of sewage origin, the Tennessee Department of Public Health will not approve the development of public bathing facilities in the reservoir unless the most probable number (MPN) of coliform organisms per 100 ml. is 50 or less, in keeping with the definition of Class A bathing waters accepted by the seven Tennessee Valley states. A study of the probability of river discharges of certain magnitudes reveals that MPN's greater than the allowed maximum will occur frequently during the season from May through September; and, consequently, the Class A standard cannot be met with certainty at any point in the reservoir during the bathing season. Under existing conditions, therefore, no public bathing developments can be permitted or approved.

Aside from the recreational aspect, the Fort Loudoun study provides an interesting evaluation of the self-purification capacity of a large reservoir as it affects the bacteriological quality of the water. Such data are useful in estimating the effect of treatment or, conversely, the degree of sewage treatment required

FIGURE 5—Effect of Severe Rainstorm on Coliform Numbers

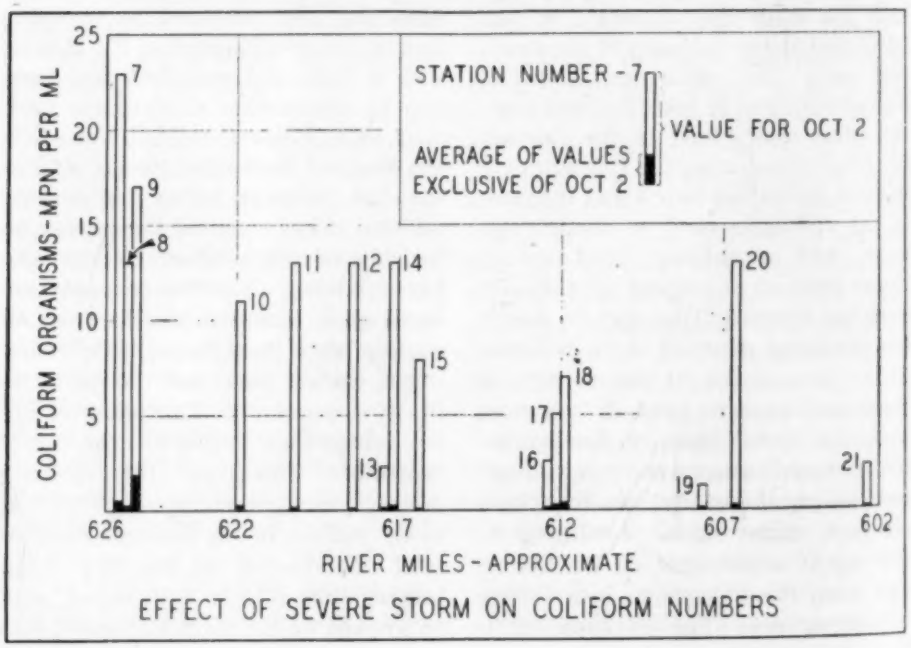
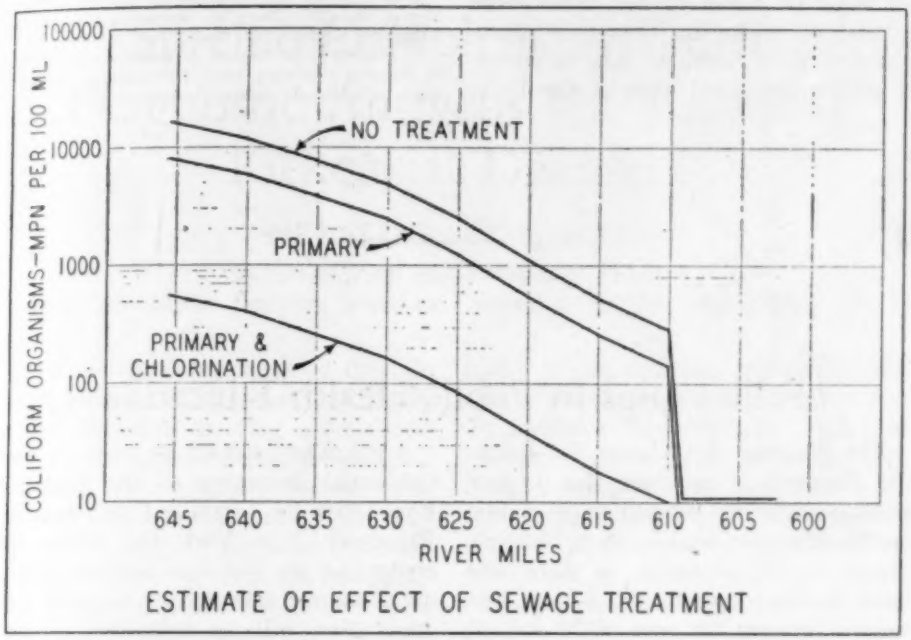


FIGURE 6—Estimate of Effect of Sewage Treatment



under a given set of conditions. At the present time, the City of Knoxville is planning sewage treatment works and has engaged consulting engineers to design the necessary facilities. An estimate of the possible effect of treatment on the bacterial quality of the water below Knoxville is shown in Figure 6. In order to present the conditions which would obtain for a large share of the time, the chart has been prepared for flows which probably will not be exceeded more than 5 per cent of the time during the month of August. This month has been chosen, since the stream flow conditions and the probability of high flows during August are generally typical of the conditions throughout the summer. The estimated effect of treatment is based on a reduction in coliform organisms of 50 per cent for primary treatment, and 98 per cent for primary treatment and chlorination.

Several possible effects have not been included in the computations for this chart. Although the calculated reductions due to treatment have allowed for the organisms in the stream passing the water works intake, they do not include the consideration that some sewage from Knoxville discharged above that point may be treated. Neither do they allow for sewage entering the river below mile 645.5, which may likewise be treated. Another factor to consider is that the computations have been based on a center of gravity of sewage discharge at mile 647.2, while the present plans contemplate a treatment plant and outfall some distance below this point. This chart should be considered, therefore, as being only an indication of the anticipated effect of treatment.

The basic information in this paper is taken from a report [2] by the Stream Sanitation Staff of the Tennessee Valley Authority, prepared under the direction of G. R. Scott. The field and laboratory

work incident to the study and the major share of preparing the report were carried out under the immediate supervision of F. W. Kittrell, now in charge of stream sanitation work of the TVA.

REFERENCES

1. A Study of the Pollution and Natural Purification of the Ohio River,. II. Report on Surveys and Laboratory Studies. *Pub. Health Bull.* 143, July, 1924.
2. Kittrell, F. W. Results of Bacteriological Studies of Potential Swimming Areas. Fort Loudoun Reservoir, 1944. Health and Safety Department, TVA.

Fellowships in Public Health Education

The National Foundation for Infantile Paralysis is providing for 1 year graduate training fellowships in public health education leading to a Master's degree to fill vacancies in state and local health departments. Men and women between the ages of 22 and 40 inclusive, who are not now employees of such departments, will be accepted.

Candidates must have a Bachelor's degree, plus 3 years of professional experience or its equivalent, and must agree to complete satisfactorily a year's academic work and 3 months of field training, and must agree to accept employment in the field of public health education in the United States for at least two years. Fellowships will be given for training only in schools of public health which have curricula in health education and which are accredited by the American Public Health Association.

Applications should be made to the Credential Secretary of the National Foundation for Infantile Paralysis (120 Broadway, New York 5). When all credentials are complete and the candidate has been accepted by a school, the application will be submitted to the Public Health Fellowship Awards Committee, an advisory subcommittee of the Public Health Service Committee on Training of Public Health Personnel. This Committee is made up of representatives of the U. S. Public Health Service, U. S. Office of Education, and professional public health educators. Its decision on applicants will be accepted as final by the Foundation.

Beginning in March, the Committee is meeting at approximately monthly intervals until the schools open in the fall or until all the fellowships have been awarded. Applications should therefore be made as early as possible.

Specific Complement-Fixing Diagnostic Antigens for Viral and Rickettsial Diseases*

HERALD R. COX, Sc.D.

Section of Viral and Rickettsial Research,
Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

IT is now generally accepted that the complement-fixation test is a highly useful method of carrying out diagnostic tests for various viral and rickettsial infections. The antigens for diagnosis of viral infections described by Frobisher,[1] Howitt,[2, 3] Casals and Palacios,[4] Casals,[5-8] Lennette and Perlowagora,[9] and Havens and his associates[10] were prepared almost entirely from infected brain tissues, whereas those reported by Mohler[11] and Brown[12] were prepared from infected chick embroyo tissues.

Various procedures, such as ether extraction,[3] repeated freezing and thawing followed by centrifugation,[4] and fractional centrifugation at speeds as high as 12,400 r.p.m. for one hour[10] were used in attempts to eliminate the anticomplementary and nonspecific properties of the preparations. Such measures were not too satisfactory, however, and this was found to be especially true when the antigens were tested in the presence of strongly positive syphilitic human sera,[4, 9, 13, 14] in which case markedly false positive reactions occurred. Similar observations were reported by Wertman[15] who found crude rickettsial antigens prepared by methods suggested by Bengtson[16, 17] and Reynolds and Pollard[18] to give markedly nonspecific fixation of complement with syphilitic sera. To overcome these difficulties with neurotropic viral antigens prepared from infected brain tissues, Casals and Palacios[4] recommended that Wassermann-negative human sera be inactivated at 60° C. for 20 minutes, whereas Wassermann-positive sera should be inactivated at 65° C. for 20 minutes. Similarly, Brown[19] has recently suggested that sera to be used with chick-embryo eastern and western equine encephalomyelitis antigens should be inactivated at 60° C. for 15 minutes in order to eliminate nonspecific reactions. Wertman[15] overcame the difficulty by using washed rickettsial or elementary body antigens for the diagnosis of rickettsial or psittacosis-lymphogranuloma-venereum infections. These latter antigens were found not to give rise to false positive reactions even when the more sensitive technique of 18 hours of fixation in the cold was used.

Inasmuch as in recent years antigens derived from infected chick embryo and mouse brain have been used on an ever increasing scale in the diagnosis of viral and rickettsial diseases, it was deemed worth while to reinvestigate these preparations for their specificity, especially with syphilitic and malarial sera. The investigations were purposely directed at the mode of preparation of the antigens themselves, because it was felt that

* Presented at a Joint Session of the Conference of State and Provincial Public Health Laboratory Directors and the Laboratory Section of the A.P.H.A. at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

TABLE 1

Complement-Fixation Tests with Unextracted Egg Antigens

	Guinea Pig Serum									*Syphilitic Human Serum*			
	Eastern E.E.			*Western E.E.*			*Normal*						
Serum Antigen	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Kolmer*
Serum Dilution													
1:4	4	—	—	—	4	—	—	—	—	4	4	4	4
1:8	4	—	—	—	4	—	—	—	—	4	4	4	4
1:16	4	—	—	—	4	—	—	—	—	3	4	4	4
1:32	4	—	—	—	4	—	—	—	—	±	3	1	4
1:64	4	—	—	—	4	—	—	—	—	—	±	—	2
1:128	3	—	—	—	1	—	—	—	—	—	—	—	—
1:256	—	—	—	—	—	—	—	—	—	—	—	—	—
Controls													
Serum 1:4	—				—				—				—
Serum 1:8	—				—				—				—
Serum 1:16	—				—				—				—
Antigen	—	—	—	—	—	—	—	—	—	—	—	—	—
Red Blood Cell	4	4	4	4	4	4	4	4	4	4	4	4	4
Hemolytic System	—	—	—	—	—	—	—	—	—	—	—	—	—

TABLE 2

Complement-Fixation Tests
Mouse Brain Antigens—Unextracted

	Syphilitic Human Serum											
	No. 1						*No. 2*					
Antigen	*Eastern E.E.*	*Western E.E.*	*St. Louis E.*	*Japanese B.*	*Normal Mouse*	*Kolmer*	*Eastern E.E.*	*Western E.E.*	*St. Louis E.*	*Japanese B.*	*Normal Mouse*	*Kolmer*
Serum Dilution												
1:4	4	4	4	4	4	4	4	4	4	4	4	4
1:8	3	3	2	3	3	4	4	4	3	4	4	4
1:16	1	2		1		4	2	4	1	3	3	4
1:32						2		3			±	4
1:64						1						3
1:128												
1:256												
Controls												
Serum 1:4					—						—	
1:8					—						—	
1:16					—						—	
Antigen					—						—	
Red Blood Cell					+						+	
Hemolytic System					—						—	

a dependable and practical procedure for the preparation of truly specific antigens would be a worth while contribution in itself, and that, furthermore, additional information might well be gained concerning the essential properties of the various infectious agents involved. For the sake of clarity, the data pertaining to the viral and rickettsial antigens will be dealt with separately.

VIRAL ANTIGENS

In preliminary experiments carried out by DeBoer and Cox[14] with antigens prepared essentially by the method of Casals and Palacios,[4] it was found that when chick embryo antigens were tested against homologous immune guinea pig sera or when mouse brain antigens were tested against homologous immune mouse sera, no cross-reactions occurred. However, both types of antigens were found to be not truly specific because they fixed complement with known positive human syphilitic sera, when the latter were inactivated at 56° C. for 30 minutes.

Table 1 shows the results obtained with chick embryo antigens of the above mentioned type. Notice the lack of specificity of these antigens in the presence of a positive syphilitic serum.

Table 2 shows the lack of specificity of similarly prepared mouse brain antigens when they were tested against 2 syphilitic sera.

The suggestion of Casals and Palacios,[4] namely, to heat the sera under test at a higher temperature in order to eliminate or minimize the nonspecific reactions, was next investigated. However, it was found that higher temperatures, though they did not greatly reduce the titer for western equine encephalomyelitis antibodies in immune sera, did almost invariably reduce them for rabies, Colorado tick fever, and St. Louis encephalitis viruses to a very significant degree. The same was found by Hughes[20] to be true for the antibodies against yellow fever virus, since they too are particularly heatabile. In many sera where the antibody titers initially are quite low, such as have been encountered particularly with rabies and Colorado tick fever antisera, it is not possible to inactivate these sera at temperatures in excess of 56° C. without rendering them unfit for testing.

Tables 3 and 4 show the effects of the inactivation temperature on the complement-fixation titers of human sera following Colorado tick fever infection and antirabic vaccination, respectively. In both instances, at least a twofold loss in titer occurred when the sera were inactivated at 60° C. for 15 minutes, as was suggested by Brown.[19] In fact, the antibody titers of antirabic vaccination sera are so low that it is difficult to demonstrate antibodies even though the tests are carried out under the most favorable conditions, that is, inactivation of the sera at 56° C. for 30 minutes and using 1½ units of complement instead of 2.

Influenced by these findings and encouraged by the results obtained by

TABLE 3

Effect of Inactivation Temperature on Complement-Fixation Titer of Human Convalescent Colorado Tick Fever Sera. Two Units of Complement

	Inactivated 56°C — 30 Minutes					*Inactivated 60°C — 15 Minutes*				
	Serum Dilution					*Serum Dilution*				
Serum Number	*1:2*	*1:4*	*1:8*	*1:16*	*1:32*	*1:2*	*1:4*	*1:8*	*1:16*	*1:32*
1	1+	1+	0	0	0	1+	0	0	0	0
2	4	4	4	2	±	4	4	1	0	0
3	4	4	3	0	0	4	4	±	0	0

TABLE 4

Effect of Inactivation Temperature on Complement-Fixation Titer of Human Sera Following Rabies Vaccination

Post-Vaccination Interval	Number of Doses Received	Units of Complement	Inactivated 56° C — 30 Minutes: Serum Dilution 1:2	1:4	1:8	1:16	1:32	Inactivated 60°C — 15 Minutes: Serum Dilution 1:2	1:4	1:8	1:16	1:32
7 days	14 1 series	1.5	3—	2—	1	±	±	2—	1—	±	±	0
		2.0	3—	1+	±	±	0	1	±	±	0	0
10 weeks	21 1 series	1.5	4	1	0	0	0	1	0	0	0	0
		2.0	2	±	0	0	0	0	0	0	0	0
10 months	28 2 series	1.5	3—	2—	1	±	±	2—	1—	±	±	0
		2.0	3—	1+	+	+	0	1	+	+	0	0

Wolfe, van der Scheer, Clancy, and Cox[21] with rickettsial antigens, using a procedure similar to that of Cragie and Tulloch,[22] and Howitt,[2, 3] it was decided to test antigens that were prepared by extracting them in the lyophilized state with various solvents. It was found that antigens for eastern and western equine viruses prepared from infected embryos and for eastern equine, western equine, St. Louis, and Jap B viruses, prepared from infected mouse brains, are rendered specific without appreciable loss in antigenicity, by extraction in the lyophilized state with benzene, toluene, or ethylene-dichloride.[14] At this point it may be worth while to note that tests made with antigens of chick embryo origin for St. Louis and Jap B were not too satisfactory in spite of the fact that infective titers of 10^{-7} and $10^{-6.6}$ or higher, were achieved for these viruses respectively. The antigens were specific inasmuch as they fixed complement only in the presence of their homologous immune sera and did not produce false positive reactions with human syphilitic or malarial sera when the method of Kolmer and Boerner[23] was employed. The antigens so prepared were also quite stable and noninfectious.

Table 5 summarizes some of the results obtained with lyophilized and benzene-extracted chick embryo antigens of eastern and western equine encephalomyelitis, as well as a normal chick embryo preparation similarly processed and tested against eastern equine, western equine, and normal guniea pig sera, and a syphilitic human serum. It is seen that the viral antigens showed positive fixation only in the presence of their homologous antisera.

Table 6 shows the results obtained with lyophilized and benzene-extracted mouse brain antigens of eastern equine, western equine, St. Louis, and Jap B viruses when tested against two known highly positive syphilitic sera. A control antigen prepared from normal noninfected mouse brains is also included. It is noted that none of the mouse brain preparations showed a positive fixation in the presence of the syphilitic sera.

Table 7 shows the results of complement-fixation tests with lyophilized and benzene-extracted mouse brain antigens against normal and immune mouse sera.

The results indicate complete specificity of both the eastern equine and western equine antigens against all sera tested, while the St. Louis and Jap B antigens showed slight cross-reactions against each other only. These observations are in accord with the findings of Casals and Palacios.[4]

In a subsequent report by DeBoer

TABLE 5

Complement-Fixation Tests

Chick Embryo Antigens Lyophilized and Benzene Extracted

	Guinea Pig Serum									*Syphilitic Human Serum*			
	Eastern E.E.			*Western E.E.*			*Normal*						
Serum / *Antigen*	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Eastern E.E.*	*Western E.E.*	*Normal Egg*	*Kolmer*
Serum Dilution													
1:4	4	—	—	—	4	—	—	—	—	—	—	—	4
1:8	4	—	—	—	4	—	—	—	—	—	—	—	4
1:16	4	—	—	—	4	—	—	—	—	—	—	—	4
1:32	4	—	—	—	4	—	—	—	—	—	—	—	4
1:64	4	—	—	—	4	—	—	—	—	—	—	—	1
1:128	±	—	—	—	±	—	—	—	—	—	—	—	—
1:256	—	—	—	—	—	—	—	—	—	—	—	—	—
Controls													
Serum 1:4	—	—	—	—	—	—	—	—	—	—	—	—	—
1:8	—	—	—	—	—	—	—	—	—	—	—	—	—
1:16	—	—	—	—	—	—	—	—	—	—	—	—	—
Antigen	—	—	—	—	—	—	—	—	—	—	—	—	—
Red Blood Cell	4	4	4	4	4	4	4	4	4	4	4	4	4
Hemolytic System	—	—	—	—	—	—	—	—	—	—	—	—	—

TABLE 6

Complement-Fixation Tests
Mouse Brain Antigens Lyophilized and Benzene Extracted

	Syphilitic Human Serum											
	No. 1						*No. 2*					
Antigen Serum Dilution	*Eastern E.E.*	*Western E.E.*	*St. Louis E.*	*Japanese B.*	*Normal Mouse*	*Kolmer*	*Eastern E.E.*	*Western E.E.*	*St. Louis E.*	*Japanese B.*	*Normal Mouse*	*Kolmer*
1:4	—	—	—	—	—	4	—	—	—	—	—	4
1:8	—	—	—	—	—	4	—	—	—	—	—	4
1:16	—	—	—	—	—	4	—	—	—	—	—	4
1:32	—	—	—	—	—	4	—	—	—	—	—	3
1:64	—	—	—	—	—	1	—	—	—	—	—	1
1:128	—	—	—	—	—	—	—	—	—	—	—	—
1:256	—	—	—	—	—	—	—	—	—	—	—	—
Controls												
Serum 1:4						—						—
1:8						—						—
1:16						—						—
Antigen						—						—
Red Blood Cell						+						4
Hemolytic System						—						—

TABLE 7

Complement-Fixation Tests
Lyophilized Mouse Brain Antigens—Benzene Extracted

Mouse Serum →	*Eastern E.E.*					*Western E.E.*					*St. Louis*					*Japanese B*					*Normal*				
Antigen	*Eastern E.E.*	*Western E.E.*	*St. Louis*	*Japanese B.*	*Normal Mouse*	*Eastern E.E.*	*Western E.E.*	*St. Louis*	*Japanese B.*	*Normal Mouse*	*Eastern E.E.*	*Western E.E.*	*St. Louis*	*Japanese B.*	*Normal Mouse*	*Eastern E.E.*	*Western E.E.*	*St. Louis*	*Japanese B.*	*Normal Mouse*	*Eastern E.E.*	*Western E.E.*	*St. Louis*	*Japanese B.*	*Normal Mouse*
Serum Dilution																								
1:4	4	—	—	—	—	—	4	—	—	—	—	—	4	4	—	—	—	4	4	—	—	—	—	—	—
1:8	4	—	—	—	—	—	4	—	—	—	—	—	4	1	—	—	—	1	4	—	—	—	—	—	—
1:16	4	—	—	—	—	—	4	—	—	—	—	—	4	—	—	—	—	—	4	—	—	—	—	—	—
1:32	4	—	—	—	—	—	3	—	—	—	—	—	4	—	—	—	—	—	4	—	—	—	—	—	—
1:64	4	—	—	—	—	—	±	—	—	—	—	—	4	—	—	—	—	—	4	—	—	—	—	—	—
1:128	±	—	—	—	—	—	—	—	—	—	—	—	±	—	—	—	—	—	—	—	—	—	—	—	—
1:256	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Controls																									
Serum 1:4	—					—					—					—									—
1:8	—					—					—					—									—
1:16	—					—					—					—									—
Antigen	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Red Blood Cell	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hemolytic System	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

and colleagues,[24] it was shown that specific diagnostic antigens for Colorado tick fever could be prepared similarly by benzene extraction of desiccated mouse brains infected with this virus. Cross-fixation tests between Colorado tick fever immune sera and various heterologous antigens of viral and rickettsial origin indicated that Colorado tick fever is a distinct entity and not related to any of the other infectious agents tested. Close correlation was obtained in the complement-fixation and mouse neutralization tests with human convalescent sera. The complement-fixing and neutralizing antibodies appeared in the blood of human patients at about the 9th to 14th day after onset of illness and remained demonstrable for as long as 34 months.

At the same time that DeBoer and Cox[14] reported their work on benzene-extracted antigens, a comparable study along the same lines was published by Perlowagora and Hughes.[13] These workers prepared specific complement-fixing antigens for yellow fever virus by extracting desiccated infected mouse brains with ethyl ether in a Soxhlet apparatus until they were lipid free. The anhydrous and lipid-free tissues were then resuspended in 0.9 per cent sodium chloride solution and the globulin fraction precipitated by one-half saturated ammonium sulfate solution. The washed and purified globulin fraction used as antigen was found to be highly sensitive and specific.

RICKETTSIAL ANTIGENS

As mentioned above, Wertman[15] used washed and "purified" rickettsial body antigens, prepared by the method of Plotz[25] and his colleagues[26-28] to overcome the nonspecific fixation results encountered in using the cruder preparations. However, the preparation of washed rickettsial body antigens is a rather laborious and costly procedure and especially difficult in the case of rickettsiae of the spotted fever group, since they do not grow as profusely as

TABLE 8

Complement-Fixation Tests on Human Syphilitic Sera

Human Syphilitic Sera	Kolmer Antigen — Serum Dilutions					RMSF Antigen No. 1 Purified and Concentrated with Sodium Sulfate — Serum Dilutions						RMSF Antigen No. 2 Benzene-Extracted and Purified with Sodium Sulfate — Serum Dilutions					
	1:4	1:8	1:16	1:32	1:64	1:128	1:4	1:8	1:16	1:32	1:64	1:128	1:256	1:512	1:4	1:8	1:16	1:32	1:64	1:128	1:256	1:512
1	4	4	4	4	2	2	4	3	0	0					3	2	0	0				
2	4	4	4	4	4	3	4	3	1	1					2	0	0	0				
3	4	4	4	4	4	4	4	3	1	0					1	0	0	0				
4	4	4	4	4	4	4	4	3	0	0					3	1	0	0				
5	4	4	4	3	0	0	3	1	0	0					2	1	0	0				
Control Sera*							4	4	4	4	4	4	4	2	4	4	4	4	4	4	4	3

* Rocky Mountain Spotted Fever Convalescent Guinea Pig Serum.

do the rickettsiae of the typhus, scrub typhus, and Q fever groups.

In a recent publication van der Scheer, Bohnel, and Cox[29] confirmed the findings of Wertman[15] that epidemic typhus, murine typhus, and Rocky Mountain spotted fever vaccines, prepared from infected yolk sacs by ether-extraction in the fluid state and used as antigens, give nonspecific reactions in complement-fixation tests with positive syphilitic sera—especially if the technic of fixation for 18 hours in the cold is used. However, they showed that purified and concentrated *soluble antigens* could be prepared from epidemic typhus, murine typhus, and Rocky Mountain spotted fever vaccines by further treating the ether-extracted preparations with benzene followed by precipitation with sodium sulfate. The resulting purified *soluble antigens* gave little or no reaction with highly positive syphilitic sera using fixation of complement at icebox temperature for 18 hours. Tests carried out with the concentrated and purified *soluble antigens* clearly differentiate cases of epidemic and murine typhus from Rocky Mountain spotted fever and will often, but not always, distinguish between epidemic and murine typhus cases. Strong cross-reactions were also observed in tests made with epidemic and murine typhus human sera and corresponding purified and washed rickettsial body suspensions prepared by the method of Plotz and colleagues,[28] but in these cases the titer obtained was always higher with the homologous than with the heterologous rickettsial antigens.

Table 8 shows the results of complement-fixation tests by the method of Kolmer and Boerner with human syphilitic sera and Rocky Mountain spotted fever *soluble antigens* Nos. 1 and 2, prepared by sodium sulfate precipitation of vaccine with and without previous extraction with benzene. It is seen

that four of the sera gave a 4+ reaction in the 1:4 dilution with the non-benzene-extracted antigen, but that the same sera gave reactions of only 1+, 2+ and 3+ in the 1:4 dilution with the benzene extracted antigen.

CONCLUSION

In conclusion, it is seen that methods are now available for the preparation of highly sensitive and specific complement-fixing antigens in an ever increasing number for the diagnosis of viral and rickettsial diseases. Specific diagnostic antigens that have been prepared in our laboratory up to the present are: *Viral antigens:* eastern equine, western equine, St. Louis encephalitis, rabies, Colorado tick fever, influenza types A and B, mumps, and psittacosis; *Rickettsial antigens:* epidemic typhus, murine typhus, scrub typhus or tsutsugamushi disease, Rocky Mountain spotted fever, Q fever, and rickettsialpox.

REFERENCES

1. Frobisher, M. A Comparison of Certain Properties of the Neurotropic Virus of Yellow Fever with Those of the Corresponding Viscerotropic Virus. *Am. J. Hyg.* 17–18:354–374, 1933.
2. Howitt, B. F. Complement-fixation Test Differentiating 3 Strains of Equine Encephalomyelitis Virus and the Virus of Lymphocytic Choriomeningitis. *Proc. Soc. Exper. Biol. & Med.*, 35:526–528, 1937.
3. Howitt, B. F. The Complement Fixation Reaction in Experimental Equine Encephalomyelitis, Lymphocytic Choriomeningitis and the St. Louis type of Encephalitis. *J. Immunol.*, 32–33:235–250, 1937.
4. Casals, J., and Palacios, R. The Complement Fixation Test in the Diagnosis of Virus Infections of the Central Nervous System. *J. Exper. Med.*, 74:409–426, 1941.
5. Casals, J. Ultraviolet Light-inactivated Antigens for Complement-Fixation Tests with Central Nervous System Virus Infections. *Proc. Soc. Exper. Biol. & Med.*, 49:501–504, 1942.
6. Casals, J. Heated, Avirulent Antigens for Complement-Fixation Tests with Certain Encephalitis Viruses, *Science*, 102:618–619, 1945.
7. Casals, J. The Technic and Practical Applications of the Complement-fixation Test for Diagnosis of Infection with Encephalitis Viruses. *J. Bact.*, 50:1–5, 1945.
8. Casals, J. Complement-fixation Test for Diagnosis of Human Viral Encephalitides. *J. Immunol.*, 56:337–341, 1947.
9. Lennette, E. H., and Perlowagora, A. The Complement Fixation Test in the Diagnosis of Yellow Fever. Use of Infectious Mouse Brain as Antigen. *Am. J. Trop. Med.*, 23:481–504, 1943.
10. Havens, W. P., Jr., Watson, D. W., Green, R. H., Lavin, G. I., and Smadel, J. E. Complement-fixation with the Neurotropic Viruses. *J. Exper. Med.*, 77:139–153, 1943.
11. Mohler, W. Complement-fixation with Chick Embryo Antigens in Equine Encephalomyelitis. *J. Am. Vet. M. A.*, 94:39–43, 1939.
12. Brown, G. C. Embryonic Chick Antigens for Complement Fixation with Viruses of Eastern and Western Equine Encephalomyelitis. *Proc. Soc. Exper. Biol. & Med.*, 56:91–93, 1944.
13. Perlowagora, A., and Hughes, T. P. The Complement-Fixation Test in Yellow Fever Epidemiology. The Use of Globulin Antigen in Immunity Surveys. *J. Immunol.*, 55:103–120, 1947.
14. DeBoer, C. J., and Cox, H. R. Specific Complement-fixing Diagnostic Antigens for Neurotropic Viral Diseases. *J. Immunol.*, 55:193–204, 1947.
15. Wertman, K. Nonspecific Complement-fixing Antigen in Embryonic Egg Tissues. *J. Lab. & Clin. Med.*, 30:112–118, 1945.
16. Bengtson, I. A. Complement Fixation in Endemic Typhus Fever. *Pub. Health Rep.*, 56:649–653, 1941.
17. Bengtson, I. A. Complement Fixation in "Q" Fever. *Proc. Soc. Exper. Biol. & Med.*, 46:665–668, 1941.
18. Reynolds, F. H. K., and Pollard, M. Employment of Rickettsial Vaccine for Antigen in Diagnostic Complement Fixation Test. *Am. J. Trop. Med.*, 23:433–435, 1943.
19. Brown, G. C. Elimination of the False Positive Reaction with Human Sera in Complement Fixation test. *Science*, 106:43, 1947.
20. Hughes, T. P. Personal communication.
21. Wolfe, D. M., van der Scheer, J., Clancy, C. F., and Cox, H. R. A Method for the Preparation of Complement-fixing Antigens in a Study of Experimental Tsutsugamushi Disease (Scrub Typhus). *J. Bact.*, 51:247–255, 1946.
22. Craigie, J., and Tulloch, W. J. Further Investigations on the Variola-vaccinia Flocculation Reaction. Med. Res. Coun. *Spec. Report Series*, No. 156, London, 1931.
23. Kolmer, J. A., and Boerner, F. *Approved Laboratory Technic*. Ch. 29. 3rd ed., New York: Appleton Century Co., 1941.
24. DeBoer, C. J., Kunz, L. J., Koprowski, H., and Cox, H. R. Specific Complement Fixing Diagnostic Antigens for Colorado Tick Fever. *Proc. Soc. Exper. Biol. & Med.*, 64:202–208, 1947.
25. Plotz, H. Complement-fixation in Rickettsial Diseases. *Science*, 97:20–21, 1943.
26. Plotz, H., Reagan, R. L., and Wertman, K. Differentiation between Fievre Boutonneuse and Rocky Mountain Spotted Fever by Means of Complement-fixation. *Proc. Soc. Exper. Biol. & Med.*, 55:173–176, 1944.
27. Plotz, H., Wertman, K., and Reagan, R. L. Laboratory Aids in Diagnosis of Rocky Mountain Spotted Fever. *Bull. U. S. Army Med. Dept.*, No. 79: 40–44, 1944.
28. Plotz, H., Wertman, K., and Bennett, B. L. The Serological Pattern in Epidemic Typhus Fever. I. The Development of Complement-fixing Antibodies. *Confidential Report from Army Medical School*, Army Medical Center, Washington, D. C., Feb. 17, 1944.
29. van der Scheer, J., Bohnel, E., and Cox, H. R. Diagnostic Antigens for Epidemic Typhus, Murine Typhus and Rocky Mountain Spotted Fever. *J. Immunol.*, 56:365–375, 1947.

Experience in Appraising Nutritional Status in the U. S. Public Health Service*

HAROLD R. SANDSTEAD, M.D., F.A.P.H.A., AND ELTON S. OSBORNE, JR., M.D.

Chief, Nutrition Section, States Relations Division, U. S. Public Health Service, Washington, D. C.; and Medical Officer in Charge of Nutrition Field Unit, Grand Haven, Mich.

FOR a number of years, various official and voluntary agencies have been working toward improving the nutritional status of the population. In 1945, the Conference of State and Territorial Health Officers requested that the Service further assist the states in developing nutritional programs. As a result of this Conference, a Nutrition Section in the States Relations Division of the Bureau of State Services was organized.

Since its inception, the basic purpose of this Service program has been to conduct field studies in the prevalence of nutritional deficiency disease to develop methods for assessing human nutrition that can be adopted by health departments, and to provide a pattern which can be utilized by state and local health departments to increase the efficiency of their public health nutrition programs.

The interest of the states in nutrition work has been demonstrated by the fact that within the past two years, 32 state and territorial health departments have requested the services of field units of the U. S. Public Health Service. One goal of this program is the active participation of all the state health departments in improving the general health of their populations by promoting better nutrition. Basic programs of this type, organized now, would prove to be of inestimable value in the event of national emergency.

In the opinion of those who organized the Public Health Service Nutrition Section, a prerequisite for an effective program was the obtaining of accurate information on the prevalence of nutritional deficiency disease. Standard methods of procedure for conducting various types of population studies in several sections of the country were thought to be highly desirable in a program of this type. Consequently, mobile field units were created and have been located in four geographic areas in the country—New England, North Central, Mid-Atlantic, and Southeast. To date, thirteen field studies have been completed. These studies were conducted in five states, Florida, Georgia, Maryland, Michigan, and Vermont.

In general, the staff of a nutrition field unit consists of a medical officer in charge, a public health nurse, a nutritionist, a biochemist, a laboratory technician, and a clerk. The personnel of the field unit, however, is occasionally changed to conform with local needs.

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 9, 1947.

The existing units have been assigned to work with state health departments on invitation from state health officers after due consideration has been given to the geographic location of the state. These field units, working as a part of the state and local health departments, have carried on the functional part of the program.

As yet, the program has been limited to the investigation and demonstration of nutritional survey techniques. Methods for determining the food patterns of populations and groups within the population have been explored. Evaluation and adaptations of laboratory methods for public health use have been progressing. A large number of persons, approximately 25,000, have been inspected for physical signs of nutritional deficiency, and some therapeutic testing both on individuals and large groups has been conducted.

The Central Office of the Nutrition Section, in addition to its functions of general supervision and coördination of the field units, is developing a program of aid and consultation to state health departments and other agencies interested in nutrition.

Wherever possible, studies have been conducted with the nutrition field unit functioning as a part of a well organized local health department. This arrangement has resulted in the utilization of the local public health nursing staff to contact and invite persons to the survey clinics. Such participation on the part of the local health department develops the interest of its personnel in nutrition and has usually resulted in clinic attendance by the persons invited. When it was not possible to work with a local health department group, it has sometimes been necessary to have the persons to be inspected contacted by a public health nurse or by a nutritionist attached to the nutrition field unit.

All the field studies have followed the same general plan of operation. The three usual approaches to a nutritional assessment have been used: dietary records, laboratory determinations, and physical inspections.

In the nutrition clinic, consideration for the patient and organizational efficiency are both stressed. Although there are minor variations in procedure among the field units, the following general outline is usually followed: The person attending the clinic is greeted by a receptionist who obtains identifying data, height and weight. A nurse is made responsible for the smooth progression of the patients through the clinic. She routes patients first to the nutritionist, second to the laboratory technician, and finally to the physician. Before the patient departs from the clinic she discusses with him any health problems which have been discovered, with emphasis on arrangements for correction through referral to family physician or health department.

The nutritionist evaluates the diet record and advises the patient about his food habits. The evaluation of diet is based on a system of coding by which the servings of each food group on the diet record can be compared with the National Research Council's [1] recommendations. For the diet record, the patient keeps a complete record of all food taken during a 24 hour period.

In the earlier studies capillary blood from a finger tip puncture was used for the following determinations: hemoglobin, hematocrit, and plasma protein. In more recent appraisals, additional capillary blood has been obtained to use in determining: serum vitamin A, serum carotene, and serum ascorbic acid by the micro-methods of Bessey and Lowry.

On individuals under 16 years of age, blood serum phosphatase is done, and on individuals 40 years or more a blood glucose determination is made, also on capillary blood. The hemo-

globin, hematocrit and plasma protein determinations are usually completed by the technician at the clinic.

The inspection is directed toward the body areas in which signs suggestive of nutritional deficiency are most likely to appear. Such inspections are greatly facilitated by the fact that the signs appear for the most part on exposed areas of the body. After completion of the inspection the medical officer reviews the reports from the nutritionist and the technician; he correlates these data with those obtained in the physical inspection and advises the patient of any obvious health problems which may be evident.

A complete report of the findings on each person is prepared for the local health officer, who usually refers the positive findings to the individual's family physician. In most areas such cases are followed up by the public health nurses until corrections are made. These positive findings are not limited to nutritional deficiency conditions but include any condition needing medical attention which might be discovered during the inspection in the nutrition clinic.

We wish to stress the importance of integrating the nutrition services with the services of other departments. Our experience in the field clinics illustrates this point. During the course of the examination for signs of nutritional deficiencies, numerous physical defects and disabilities other than nutritional are observed. We believe that interest in general health, and not interest in nutrition alone is an important factor in attracting adults to the nutrition clinics. For example, in one study of families, comprising 1,434 individuals, 463 were found to have physical conditions indicating referral for medical consultation. The majority of these individuals were not under the care of physicians and in most instances were unaware of their condition.

As might be expected, many medical problems of interest are revealed at the clinic. For example, in a family study in a mining village 55 per cent of the persons 45 years of age and older had either a systolic blood pressure over 150 mm. Hg. or a diastolic blood pressure over 100.

At this point it should be reëmphasized that nutrition is a part of general medicine and in assessing the nutritional status of an individual, influencing factors such as infection, physiological stresses, and disease must be taken into consideration in nutrition evaluation.

The studies which have provided the most complete information regarding the nutritional status of a community, have been of the family type. These surveys have been planned to provide a random sample of an entire population.

In this type of survey, the family, including all members of the same household who eat an average of two meals daily at the same table, is the basic unit. This assures a wide age distribution. The families to be inspected have been selected on a pattern that provides a true random sample of the population.

Usually it has been found advisable to delay the beginning of the family type survey for some time after the field unit moves into a new community. In order to gain the coöperation of the families selected for the survey, some preliminary publicity and other work have been necessary. Consequently, the field unit has frequently first conducted studies of certain special groups, such as school children and industrial workers.

There is no doubt that it is very difficult to impart nutrition education in one clinic visit, but we feel that this one visit is more effective in teaching good nutrition than the usual nutrition propaganda to which we are all subjected.

PREVALENCE OF PHYSICAL SIGNS ASSOCIATED WITH DEFICIENCY DISEASE

In presenting data on the prevalence of physical signs which have been found in these studies, it is recognized that, as in any medical examination, diagnosis on the basis of a single physical sign is hazardous, and that many of these so-called signs are based on too little evidence. One of the greatest needs in nutritional appraisals is a better understanding of the signs and symptoms which have been listed as evidence of deficiency disease. Particularly is this true of the diagnosis of vitamin A deficiency.

For purposes of this report the classifications of signs and symptoms of vitamin deficiencies listed by the Council on Food and Nutrition of the American Medical Association[2] is followed. Among the conditions that are believed to be associated with nutritional deficiencies are the following: vitamin A deficiencies (folliculosis of the palpebral conjunctiva, thickening of the bulbar conjunctiva and spots, xerosis and follicular hyperkeratosis); vitamin B-complex deficiencies (outer canthi lesions, nasolabial seborrhea, follicular plugs, stomatitis, and glossitis); vitamin C deficiencies (gingivitis, perifollicular petechiae, and purpura). Abnormal response to tests for knee jerks, ankle jerks, and vibratory sense, and calf tenderness may be indicative of neurological changes also due to a deficiency of B-complex.

To allow for all possible inclusions, the Nutrition Appraisal Record used by the field units provides for more than the findings enumerated above. Some of these may be of questionable dietary significance and, when more specific knowledge is acquired, they may eventually be dropped from the list. Others are of infrequent occurrence but highly significant when they do occur.

The Nutrition Appraisal Record has been in use since January, 1946. This record form pools all the information for one individual (physical inspection in detail, dietary and laboratory data). It is thus now possible to compare the results of one group of school children with another, and one family study with another. The data are fairly comparable because all personnel engaged in the field spend a period of training in one of the units and assist in making a study, before being assigned to work independently.

SCHOOL STUDIES

Slightly more than 1,800 white school children have been examined by the units in the North Central and Mid-Atlantic regions. The school children consisted of those attending (1) grades 4 through 8 in three Maryland schools, (2) the first through the 8th grade in two Maryland schools and one school in Michigan, and (3) high school students in one community in Michigan. There is considerable variation between schools in the same area as well as in different regions. In May, 1946, grade school children were examined in three schools in Maryland and one school in Michigan with a consistently higher prevalence of certain physical findings in Michigan. In the fall of 1946, children were studied in two grade schools in Maryland, and during the winter in a high school in Michigan.

For the more important diagnostic findings, the prevalence in the five school groups was as follows: Forty-seven per cent of the children in the 1st through the 8th grades in the Michigan school and 46 per cent of the high school students had conjunctival folliculosis. Only 2 per cent of children in the combined Maryland Schools study suffered from this condition. In the remaining two Maryland schools the prevalence was 28 per cent and 23 per cent.

Xerosis and follicular hyperkeratosis of the skin were present in 39 per cent

of the children in the 8 grades that constituted the grade school study in Michigan, and 28 per cent of the high school students. In Maryland, the highest prevalence noted in any of the schools studied was 5 per cent for this sign.

One or more tongue conditions were recorded in 12 per cent of the children inspected in one of the school groups in Maryland, 7 per cent in another, and in 8 per cent of the children in the Michigan school group (all 1–8 grades). The prevalence in the remaining grade schools and among high school students was low.

Gingivitis, likewise was high (11 per cent) in one of the Maryland schools (1–8 grades). It ranged from 2 to 6 per cent in the rest of the school groups.

FAMILY STUDIES

To date, six family studies consisting of 3,862 persons have been completed in Florida, Georgia, and Michigan. Another study has been under way in Michigan since April, 1947, and an eighth was started in Vermont during September. One family study was Negro and another partly white and partly Negro. The remaining studies were conducted among white populations.

The prevalence of physical findings in family studies has a different distribution from that among school children. Thickening of the bulbar conjunctiva and spots was the most frequent sign found in Negroes (37 per cent), followed by conjunctival folliculosis (32 per cent), and gingivitis (25 per cent). Among white persons, gingivitis was present in 24 per cent of the population, and thickening of the bulbar conjunctiva and spots in 26 per cent, xerosis and follicular hyperkeratosis in 15.2 per cent and conjunctival folliculosis in 15.1 per cent.

The difference in magnitudes between school and family groups is due to the fact that certain physical conditions change with age. Although the per cent of white persons of all ages with thickening of bulbar conjunctiva and spots was 26, the per cent was less than 1 in children under 13 years of age, 53 per cent for white males 21 years of age and over, and 42 per cent for white females, in the same group. Among Negroes, the differences were even more marked: 1 per cent for children under 13, 83 per cent for males and 75 per cent for females 21 years of age and over.

Conjunctival folliculosis, which was the leading physical finding in the school group, was found in 15 per cent

TABLE 1

Prevalence of Selected Physical Findings Suggestive of or Associated with Dietary Deficiencies in Nutrition Studies in Three Areas of the United States, by Color, During 1946–1947

Deficiency, and Physical Finding	*School Studies, All White Children*	*Family Studies*	
		White	*Negro*
Persons in Study →	*1,822 (100%)*	*2,742 (100%)*	*1,120 (100%)*
Vitamin A			
Conjunctival folliculosis	27.2	15.1	32.1
Thickening of bulbar conjunctiva and spots	2.5	25.9	37.0
Xerosis and hyperkeratosis	11.1	15.2	17.9
Vitamin B			
Tongue conditions	6.5	18.4	4.2
Vitamin C			
Gingivitis	6.1	23.6	25.1
Vitamin D			
Rickets	15.8	7.8	8.9
Iodine — Goiter	8.5	13.0	4.2

TABLE 2

Prevalence of Enlarged Thyroid in Nutrition Studies in the United States, October, 1945–May, 1947, by Age, Sex, and Race

Area and Race	Number of Persons Examined		Per cent Having Enlarged Thyroid							
			Male				Female			
	Male	Female	All Ages	Under 13	13 to 20	21 and Over	All Ages	Under 13	13 to 20	21 and Over
Family studies										
White										
Alachua County, Fla.	331	489	...	...	...	...	4.1	0.7*	6.5*	5.5
Pelham, Ga.	137	233	8.0	...	5.0	10.0	31.3	...	40.4	32.3
Flint Mill, Ga.	177	177	1.7*	3.3*	...	1.0*	2.3*	...	...	4.3*
Kitzmiller, Md.	167	213	7.2	7.4	20.0	2.7*	23.0	8.1	33.3	28.1
Houghton County, Mich.	263	555	4.9	2.3*	6.7*	11.7	33.3	4.7	29.8	48.2
Negro										
Alachua County, Fla.	271	340	...	...	...	...	12.4	1.0*	25.6	15.7
Ferndale, Mich.	201	308	2.5	2.3*	11.1*	...	14.6	3.0*	20.0*	24.5
School studies										
White										
Alachua County, Fla.	1,764	1,908	0.4	0.2*	0.8	...	1.4	0.4	2.8	...
Allegany County, Md.	162	173	...	...	...	...	...	...	...	...
Cumberland, Md.	477	477	0.2*	0.2*	...	...	2.3	2.1	20.0*	...
Holland, Mich.	182	147	32.4	...	32.4	...	52.4	...	52.4	...
Royal Oak, Mich.	106	98	0.9*	...	7.7*	...	5.1	4.8*	6.7*	...
Brattleboro, Vt.	878	949	...	...	...	...	0.8	0.5*	1.5	...
Negro										
Alachua County, Fla.	1,129	1,324	...	...	...	...	2.2	0.6	5.3	...

* Based on less than 5 persons

TABLE 3

Prevalence of Signs Suggestive of Rickets in the United States, October, 1945–May, 1947, by Age, Sex, and Race

Area and Race	Number of Persons Examined		Per cent Having Signs Suggestive of Rickets							
			Male				Female			
	Male	Female	All Ages	Under 13	13 to 20	21 and Over	All Ages	Under 13	13 to 20	21 and Over
Family studies										
White										
Alachua County, Fla.	331	489	1.5	2.5*	2.7*	...	...	...	...	...
Pelham, Ga.	137	233	21.9	41.2	25.0	18.0	10.7	15.8*	6.4*	11.4
Flint Mill, Ga.	177	177	0.6*	...	...	1.0*	0.6*	1.6*	...	...
Kitzmiller, Md.	167	213	19.8	19.1	24.0	18.9	8.0	4.8*	6.7*	9.9
Houghton County, Mich.	263	555	20.2	16.2	40.0	21.7	8.8	6.5	14.9	9.2
Negro										
Alachua County, Fla.	271	340	0.4*	0.8*	...	...	0.6*	...	...	1.0*
Ferndale, Mich.	201	308	28.4	25.2	55.6	26.9	13.0	13.4	11.4*	13.0
School studies										
White										
Alachua County, Fla.	1,764	1,908	4.0	4.6	2.9	...	2.1	2.3	1.8	...
Allegany County, Md.	162	173	0.6*	1.4*	...	...	...	...	...	...
Cumberland, Md.	477	477	14.9	14.6	25.0	...	8.8	8.9	...	...
Holland, Mich.	182	147	46.2	...	46.2	...	32.7	...	32.7	...
Royal Oak, Mich.	106	98	24.5	19.4	61.5	...	16.3	19.3	...	...
Brattleboro, Vt.	878	949	9.5	9.9	8.7	...	3.7	4.2	2.7	...
Negro										
Alachua County, Fla.	1,129	1,324	7.7	8.0	7.0	...	6.3	6.6	5.7	...

* Based on less than 5 persons

of all white persons studied. It was found in 30 per cent of the children under 13 years but decreased in prevalence with advancing age. Forty-eight per cent of Negro children under 13 years in the family studies were found to be suffering from this condition.

The prevalence of gingivitis increased with age, so that for adult white males the figure was 59 per cent, for females, 38 per cent, against the averages for all ages of 27 per cent. Comparative figures for Negroes were 62 per cent, 46 per cent, and 25 per cent.

Table 2 shows the prevalence of enlarged thyroid in family and school groups studied from October, 1945, through May, 1947. The prevalence for females at all ages combined was higher than for males in all groups. In most instances the prevalence was greater among adults than among children.

The highest percentages were found in the Michigan groups. In the family study, 48 per cent of females 21 years of age and over had an enlarged thyroid. Among high school students in Holland, Mich., 52 per cent of the girls and 32 per cent of the boys showed this condition.

Table 3 shows the prevalence of signs suggestive of rickets in the same groups of persons who were presented in Table 2. Signs of rickets were, in general, more prevalent among males than females in those groups in which the condition was of frequent occurrence. The prevalence was higher in children and young adults than in older persons.

Among boys under 13 years of age, the highest proportion (41 per cent) occurred in a white family study in Georgia. In a Michigan grade school in which the economic level was low, 61 per cent of the boys over 13 years of age showed signs of rickets. In certain studies, there were few evidences of this condition.

What conclusions can be made from these data? The physical signs attributable to vitamin A deficiency are very prevalent. If these are reliable signs, then vitamin A deficiency is a major problem, at least in the areas where these studies have been made. Additional studies are needed before final conclusions can be drawn.

Next in the order of prevalence is gingivitis. If this represents vitamin C deficiency, it is a major problem in this country. However, we still lack controlled studies demonstrating what percentage of this is related to C deficiency and what percentage is caused by other factors.

Although there are other causes of glossitis it is our impression that this is a fairly reliable sign of B-complex deficiency. If the prevalence of this sign is a good index of B-complex deficiency, then this too constitutes a major public health problem.

Two conditions for which we have for some time had the knowledge for prevention and control are endemic goiter and rickets. Both of these conditions are found with considerable prevalence and represent major health problems which should be the object of continuous attack by the medical profession and health departments.

Fortunately, because we do not have the emergency of actual starvation or serious food shortages seen in much of the rest of the world, our health officials have the opportunity for carefully considered long-range programs in public health nutrition.

Considerable thought, based on field experience, has been given to the development of an administrative pattern for more comprehensive nutrition programs in state and local health departments.

The following pattern, which provides for a division of functions between state and local health departments, is being recommended to state health departments:

A. At the state health department level, facilities and services are suggested which would be financially impractical for the average local health department. These include:

1. Establishment of the nucleus of a nutritional epidemiological unit. At first this may consist only of a physician and a nutritionist with knowledge of appraisal procedures. They could conduct surveys and resurveys of various population groups to determine the prevalence of nutritional problems, and to promote local interest in nutrition. It would be necessary for the local area to assist with personnel in such surveys. Local nursing and clerical assistance would be needed along with the services of a state district nutritionist. Later, a division of public health nutrition, with a physician as its director, would probably evolve. State health departments already are employing nutritionists, who will continue to play an important role in any expanding nutrition program.

2. Provision of laboratory facilities in the state health department laboratory to serve the nutrition epidemiological unit mentioned in A, 1. These laboratory facilities should also be available to hospitals and local health departments throughout the state. Although these facilities would at first have to be made available only to institutions that were equipped to collect and prepare specimens for transportation, they would be offered to all institutions and to all licensed physicians as soon as more practical methods of preserving specimens for transporting are developed.

B. At the local health department level the following activities would probably be practical in average size departments with jurisdiction over populations of 50,000 or more.

1. Employment of a public health nutritionist to work continually with and through the public health nurses to promote improved nutrition in the local population. This nutritionist would conduct continuous inservice training in nutrition for the local public health nurses. She could prepare special diets for patients on a physician's prescription. She would assist public institutions which do not have a trained dietitian, coöperate with welfare agencies in preparing low income diets, participate in and guide promotional and educational programs in nutrition, and work closely with all types of clinics operated by the health department.

In any such program it is well to emphasize again that nutrition work should be well integrated with other functions of the state and local health departments. In planning this program we must not be discouraged because of shortage of trained personnel, and laboratory facilities. It must be remembered that no public health program was ever initiated under ideal circumstances.

REFERENCES

1. Food and Nutrition Board, National Research Council, Reprint and Circular Series, No. 122. *Recommended Dietary Allowances.* Revised 1945, Washington, D. C.

2. *J.A.M.A.*, 131, 8:666 (June 22), 1946.

Appraising the Nutritional Status of Mothers and Infants*

CLEMENT A. SMITH, M.D., AND
HAROLD C. STUART, M.D., F.A.P.H.A.

Boston Lying-in and Children's Hospitals; and Department of Maternal and Child Health, Harvard School of Public Health, Department of Pediatrics, Harvard Medical School, Boston, Mass.†

DR. Stuart and I have interpreted the title which we have been assigned on this program to refer to the appraisal of the individual mother and infant from the standpoint of recognizing general malnutrition or specific deficiencies in nutritional status. This is a very different and more difficult problem than that of assessing populations of mothers and infants from the standpoint of the incidence of nonspecific signs and symptoms and events which are known to be highly correlated with faulty maternal diet.

The finding that a new-born infant is very short or very light in weight does not justify the assumption that his mother's diet must have been deficient during pregnancy, for there are many other reasons why he might be small at birth. Group studies of the heights and weights of new-born infants in relation to the adequacy of their mothers' diets, however, justify the assumption that a declining average birth weight and length or an increase in the number of small babies born in a given period of time may well be due to changes in the general level of maternal nutrition during the period. Changes in the incidence of such conditions as toxemia during pregnancy, stillbirth rates, premature birth rates, and neonatal death rates all justify serious consideration of the nutritional problems which may be involved. This introductory statement is made because in stressing the difficulties of appraising the nutritional status of individual mothers and new-born infants we are not considering the possible usefulness of certain signs and procedures as tools in group studies.

It happens that one of our main research projects illustrates very well the difficulties of the entire subject. Let me state our problem simply. We have, in the Boston Lying-in Hospital, a large supply of clinical material, plus a staff of obstetric and pediatric colleagues as keen and coöperative as might be desired. We have another group of associates able to record and evaluate nutritional histories with the caution and objectivity of long experience. We have facilities and personnel capable of making most laboratory measurements. Yet, faced with two Boston women and asked "Which is in better nutritional status—Mrs. A or Mrs. B?" we often feel at a loss for an answer. When, a day or so later, we are asked to answer the same question with regard to Baby A and Baby B, we feel very frustrated indeed.

No doubt, if we were comparing the

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 9, 1947.

† Studies referred to were supported in part by a grant from the Nutrition Foundation, New York City.

status of a small group of our patients with a group in China, or even in Birmingham, Ala., we could make a better showing for ourselves. But the difficulty is to rate *individuals* living in a region of relatively good nutritional circumstances. Perhaps a published example from a sound American study [1] in another northern state will show how this trouble arises.

Charts from Bethell's investigation of the relationship between the iron intake of Michigan women and the development of anemia during their pregnancies, showed that almost none of the women receiving the recommended daily intake of 15 mg. of iron became anemic. Of those with intakes below 8 mg., about 35 per cent did so. The chart thus clearly shows that iron intake is correlated with microcytic anemia. Yet these data indicate equally clearly that the clinician and laboratory worker could hope to appraise the past intake of iron correctly in only one out of every 3 pregnant women whose diets had contained one-half or less of the recommended daily allowance of an important nutritional item. Fully recognizing the risks of over-simplification, let us consider what might be expected of the infants produced by women on iron deficient diets. The classic work of Strauss [2] demonstrated that babies produced by mothers on such diets became significantly anemic at 6 months of age. He also showed that shortly after birth these infants of iron-deficient women had blood findings indistinguishable from those of infants born to women with good iron intakes.

After this rather querulous introduction to a very real dilemma, we may now examine the tools available for appraisal of nutritional status at whatever phase of life. These are (1) the *nutritional history*, (2) the general and specific symptoms and signs discoverable by *medical history* and *physical examination, and* (3) the results of *laboratory measurements*. The first, of course, applies directly to the mothers and only indirectly to the new-born infants. Physical and laboratory examinations can, of course, be performed on both subjects.

1. Theoretically, the *nutrition history* has better potentialities than either of the other two. Obviously a laboratory scientist who knows *exactly* what an adult experimental rat (with normal absorptive powers) has eaten since birth should be able to compare that rat nutritionally with other rats of known intake. He could make a more accurate comparison by the nutritional history than by weighing the rat, feeling its hair, or measuring anything he might get from its blood or excreta. (If this hypothesis is not true it means that physical or laboratory findings are conceived to be more reliable than actual food intake. Probably no one would go that far—or would he?) To return to the matter in hand, we do not for a moment believe that the best nutritionist can get data as accurate as the record of a laboratory animal from a history of the most intelligent and coöperative mother. The point is, nevertheless, that the nutrition history *as a method* contains an element of direct relationship to the subject's nutritional state which is lacking in the other two methods. Otherwise the rather pernicious term "subclinical nutritional deficiency" would not be so often used.

If the inaccurate histories of vague informants are rejected as ruthlessly as would be laboratory measurements made with dirty glassware, if one includes an accurate record of the diet previous to pregnancy, and is careful to consider vomiting and other disturbances of absorption, the nutrition history offers an appraisal of unique value. We should especially like to stress the importance of diet before pregnancy in such a history, because of our Dutch experience. This indicated that mothers presumably

receiving an adequate diet previous to an acute period of nutritional deficiency show effects quite different from those appearing in pregnant women whose diets have been chronically inadequate.[3]

2. *Medical history* and *physical examination* as means of assessing nutritional status have disturbed us a good deal. It is somewhat revealing that at one point in our past efforts an obstetrician associated with our group said that he did not think he could rate mothers nutritionally, but he thought he could rate their babies, and at least one of our pediatricians thereupon mused that *he* was having a hard time rating the babies, but he would be glad to try rating the mothers. This simply illustrates the commonplace that the more closely one studies living organisms, the more cautious he becomes about quick judgments as to their individual superiority, inferiority, or, indeed, normality. Vilter, Morgan, and Spies[4] have recently published an interesting description of the deficiency syndromes appearing during pregnancy. Although the frequency of individual symptoms was not tabulated, the authors indicated that such signs are brought into clinical prominence by pregnancy to a degree beyond their frequency in non-pregnant women. This is certainly what one would predict. Yet we have not found skin, eye, neurological, or other signs nearly so commonly in our pregnant subjects as logic and the literature would lead us to expect. For example, 11 cases of polyneuritis have been diagnosed in more than 45,000 pregnancies over the last 20 years at the Boston Lying-in Hospital. Indeed, we are so troubled by this state of affairs that arrangements are now under way to send a member of our group to study in another region of the country at a nutrition clinic where these physical signs are reported much more frequently than we are able to discover them.

So far as examining the *infant* for physical evidence of nutritional adequacy, the problem is even more challenging. There are plenty of evidences that human fetal growth results in a fairly standardized product—at least in terms of nutrition and its components circulating in the blood stream. This is shown by the extraordinary rarity, in neonatal life, of the common nutritional deficiencies of infancy—rickets, scurvy, and anemia. It may be that only by following infants over 6 to 12 months after birth can one really appraise what is hidden in them when born. Such a method, of course, would have to be safeguarded by appraisal of nutritional and environmental factors added to the baseline established at birth. It would not be easy.

Variations in length and weight at birth, so easily correlated with maternal nutrition in animal studies, are not sufficiently specific to be relied upon in appraising the nutrition of the new-born infant—or, at least, in relating his nutritional status as an individual to that of his mother as an individual. This appeared in our study of pregnancy in undernourished women in Holland. The distribution curves indicated that birth weight and length fell as starvation continued, but many individual women who had lost weight during pregnancy gave birth to infants above the length and weight averages of those born to well nourished women in times of peace.

This failure of fetal weight gain to be a consistent reflection of maternal nutritional status is also a drawback to the use of special methods such as x-ray appraisals of osseous development and of measurements of tissue breadths as more delicate means of estimating the nutritional status of infants. Indeed, all we feel able to say at the moment is that the infant's size, as well as the amount and character of his measurable tissues, are in some measure, but by no means wholly, dependent upon maternal nutritional intake.

3. It was, therefore, our hope to find in

laboratory measurements the means of accurate nutritional appraisal. This seemed likely to reveal some useful mathematical data by which mother could be compared with mother, infant with infant, and (most desirable of all) infant nutritionally correlated with mother. As with Bethell's study of iron intake described above, we soon learned that correlations between maternal protein and vitamin intakes and the blood levels of these items are loose. Actually, correlation *can* be demonstrated for most items if sufficiently large groups are used. For ascorbic acid, the correlation between maternal intake, maternal blood level, and neonatal blood levels demonstrated sometime ago by Teel and Burke[3] is one of the closer ones. For vitamin A, there would appear to be almost no correlation at all. For other items, particularly riboflavin, we attempted to get our own information.

Warned by Dr. Lowry and others not to draw conclusions about riboflavin from blood levels, we worked a long time at trying to evaluate assays of this substance in the urine of new-borns. Unhappily, these subjects are notoriously uncoöperative in the matter of timed urine specimens. Therefore, we put in a good many hours appraising creatinine excretion as a guide to adequacy of urine collection. It would have been most satisfactory if new-born infants exhibited that constancy of creatinine excretion characteristic of adults. Unfortunately, as Dr. Stearns has indeed already shown, creatinine is not excreted in constant daily quantities by new-born infants. This exemplifies another difficulty of laboratory measurements in the neonatal period, a time when performance of the kidney obeys somewhat different laws from those which govern its performance during adult life.

For these reasons, and because the really important matter is not how much of a nutrient is circulating or being excreted, we have recently been measuring the various nutritional items stored in the liver. This, of course, involves confining our present efforts to miscarriages, stillbirths, and neonatal deaths. It does not mean at all that we have given up as insoluble the problem of laboratory appraisal of nutrition in the living infant. Information as to storage, secured from a small, carefully studied series, does seem to offer a foundation of fact upon which we hope to proceed more wisely with the blood sample techniques applicable to clinical material.

In summary, our experience indicates that no satisfactory methods are yet available for the *exact* appraisal of nutritional status in individual pregnant or puerperal women and in individual new-born infants. Relations which may have statistical significance in interpreting the diet of pregnant women in groups are not always applicable to the interpretation of the state of nutrition of the individual. This is particularly true of subjects under relatively good nutritional circumstances. In more obvious degrees of starvation and malnutrition, the appraisal becomes easier. Even in those ranges the infants will differ largely in distribution curves constructed from measurements made upon groups. No single measurement gives promise of being especially useful; nutrition histories, physical examinations, and laboratory tests must be combined.

In view of the more than medical significance of the problem, the absence of simple methods for appraising nutritional status of mothers and infants is an important challenge to the ingenuity of workers in obstetrics, pediatrics, and nutrition.

REFERENCES

1. Bethell, F. H., Blecha, E., Van Sant, J. H. Nutritional Inadequacies in Pregnancy Correlated with the Incidence of Anemia. *J. Am. Dietet. A.*, 19:3:165–172 (Mar.), 1943.

2. Strauss, M. B. Anemia of Infancy from Maternal Iron Deficiency in Pregnancy. *J. Clin. Investigation*, 12:345–353 (Mar.), 1933.

3. Smith, C. A. The Effect of Wartime Starvation in Holland upon Pregnancy and Its Product. *Am. J. Obst. & Gynec.*, 53, 4:599–608 (Apr.), 1947.

4. Vilter, C. F., Morgan, D., Spies, T. D. Nutrition in Pregnancy: the Effects of Dietary Deficiency in Pregnancy and the Detection and Treatment of Nutritional Deficiency Diseases. *Surg., Gynec., & Obst.*, 83, 5:561–571 (Nov.), 1946.

5. Teel, H. M., Burke, B. S., and Draper, R. Vitamin C in Pregnancy and Lactation. I. Studies during Pregnancy. *Am. J. Dis. Child*, 56:1004–1010 (Nov.), 1938.

United Nations Appeal for Children

The Association's 75th Annual Meeting in October adopted a resolution of approval of "the program of the International Children's Emergency Fund and urges that it receive full and immediate support of the government and people of the United States."

The channels through which immediate and material support can be given to the program have now been announced. The United Nations Appeal for Children for the sinews of the war against starvation is being made through a federation of major voluntary foreign relief agencies designated by President Truman to handle American participation in the world-wide appeal for children. This organization, the American Overseas Aid and United Nations Appeal for Children, in February began a $60,000,000 campaign to provide funds for the International Children's Emergency Fund and 24 private overseas relief agencies.

Up to now the Children's Fund has been supported largely by governments, the United States having made an initial contribution of $15,000,000 with another $25,000,000 to be made available on a matching formula. Pledges from 14 governments and UNRRA totaled $40,000,000 in mid-January.

In January, the Emergency Fund was providing a daily supplementary meal to nearly four million children and pregnant and nursing mothers in 12 European countries. This feeding is done through infants' and children's centers, schools, orphanages, and maternity centers.

Maurice Pate of the United States is Executive Director of the Fund, Dr. Ludwik Rajchman of Poland is Chairman of its Executive Board, and Martha M. Eliot, M.D., is its Chief Medical Consultant.

Each reader of the *Journal* can echo the Association's resolution by sending his contribution—speedily and generously—to:

American Overseas Aid and
United Nations Appeal for Children
39 Broadway
New York 6, N. Y.

A Schick Survey of 18,000 Naval Recruits*

F. S. CHEEVER, M.D.

Department of Bacteriology and Immunology, Harvard Medical School, Boston, Mass.

THIS paper is a preliminary report of the results of a Schick survey carried out among naval recruits in the period October, 1941—January, 1942, under the direction of Captain LeRoy D. Fothergill, Medical Corps, U. S. Naval Reserve. The purpose of the survey was twofold—first: to determine the percentage of recruits susceptible to diphtheria, and second: to determine what proportion of these susceptibles could safely be immunized with diphtheria toxoid. The rapid mobilization of men from all parts of the country for military training and service during the latter half of 1941 had created conditions favorable to the spread of many communicable diseases—and particularly those whose etiological agents gain entrance to the body via the respiratory tract. The 1940–1941 outbreak of diphtheria in Halifax had drawn attention to the dangers of a situation in which a virulent strain of the diphtheria bacillus was introduced into a relatively susceptible population living under conditions of marked overcrowding. Since the status of an individual's immunity against diphtheria could be determined easily, and since effective means of artificial immunization were available, it was felt that such a survey would yield valuable information as to the possibilities of an outbreak of this disease, and as to the feasibility of a program of active immunization with diphtheria toxoid.

The recruits examined, over 18,000 in number, were drawn from all parts of the country. They had been newly inducted into the Naval Service, many of them within a matter of days, all of them within a few weeks. They were divided among the four U. S. Naval Training Stations in operation at that time, as shown in Table 1. The great majority of the recruits tested were young adults; the age distribution is given in Table 2.

TABLE 1

Distribution of Recruits Among Training Stations and Incidence of Schick-positive Reactors

Training Station	*Number Tested*	*Percentage*	*Incidence of Positive Schick Reactors*
Newport, R. I.	4,904	26.5	40.9
Norfolk, Va.	4,560	24.7	16.6
Great Lakes, Ill.	4,017	21.7	47.5
San Diego, Calif.	4,996	27.0	32.7
Unknown	22	0.1	..
Total	18,499	100.0	34.2

The Schick test was carried out by

* Presented before the Epidemiology Section of the American Public Health Association, at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.

TABLE 2

Distribution of Recruits by Age

Age	No. of Recruits	Percentage
17	4,664	25.2
18	2,972	16.1
19	1,922	10.4
20	1,455	7.9
21	2,364	12.8
22	1.510	8.2
23	957	5.2
24	674	3.6
25	524	2.8
26	424	2.3
27–52	1,033	5.5
Total	18,499	100.0

injecting intradermally into one forearm 0.1 ml. of a standard diphtheria toxin so diluted that 0.1 ml. contained 1/50 m.l.d. The Moloney test was performed simultaneously by injecting 0.1 ml. of a 1:100 dilution of diphtheria toxoid into the other forearm by the intradermal route. The tests were read and the measurements of any positive reactions recorded at the end of 48 hours, and again at the end of 120 hours. The interpretation of the measurements of the individual tests were all carried out by one person (Captain Fothergill). Pertinent data concerning each recruit were collected at the time the test was performed. These included name, age, place of birth, place of residence before and after the age of 10 years, any history of an attack of diphtheria in the individual or in members of his immediate family, and finally any history of active or passive immunization against diphtheria.

The results of the Schick tests are summarized in the last 2 columns of Table 1. The incidence of Schick-positive reactors for the group as a whole was 34.2 per cent, i.e., according to the Schick test approximately 1 recruit out of 3 was susceptible to diphtheria. The results of the Moloney tests are given in Table 3. The incidence of positive Moloney reactions among susceptible recruits (i.e., those giving Schick-positive reactions) was 24.4 per cent. Thus, approximately 1 susceptible recruit out of 4 would have reacted unfavorably to injections of toxoid had it been necessary to institute a program of immunization with this agent. As was expected, the incidence of positive Moloney reactions was significantly higher in recruits giving negative Schick tests.

The marked variation between the incidence of Schick-positive reactions in the four subgroups (i.e., 16.6 per cent at Norfolk as compared to 47.5 at Great Lakes) suggested further breakdowns in an effort to determine what factors could be correlated with susceptibility to diphtheria. Recruits were divided according to the geographical area (New England, Mid-Atlantic, South Atlantic, East South Central, West South Central, Mountain, and Pacific) in which they were born, in which they resided until the age of 10, and in which they lived after the age of 10. The figures for these three groups parallel each other reasonably closely.

The incidence of Schick-positive reactions was significantly higher in the northern half of the country no matter what classification (birthplace, residence to age 10, residence after age 10) was used. The reasons for this are not clear. The relatively greater amount of clinical

TABLE 3

Moloney Reactions by Immunity Status

	Moloney-Positive		Moloney-Negative		
Category	No.	Percentage	No.	Percentage	Total
Susceptible	1,538	24.4	4,773	75.6	6,311
Immune	5,998	49.2	6,190	50.8	12,188
Total	7,536	40.7	10,963	59.3	18,499

(and presumably subclinical) diphtheria in the South at present may be the important factor in the lower incidence of individuals susceptible to the disease, or again more vigorous campaigns for active immunization against diphtheria may be the cause. These and other possible factors require further analysis before an accurate appraisal of their relative importance may be made.

The incidence of Schick-positive reactions classified according to the age of the individual recruit is shown in Table 4. Contrary to expectations the percentage of recruits susceptible to diphtheria increased rather than decreased with age, and there was no evidence that any gradual immunization of the population presumably due to clinical or subclinical attacks of the disease occurred between the ages of 17 and 26. It is planned to analyze these figures further by comparing the age trends in different geographical sections of the country.

TABLE 4

Incidence of Schick-positive Reactors by Age of Recruit

Age	No. Tested	Schick-positive	
		No.	Percentage
17	4,664	1,256	26.9
18	2,972	931	31.3
19	1,922	649	33.8
20	1,455	468	32.2
21	2,364	819	34.6
22	1,510	648	42.9
23	957	400	41.8
24	674	277	41.1
25	524	223	42.6
26	424	190	44.8
27–52	1,033	550	43.6
Total	18,499	6,311	34.1

An attempt was made to evaluate the effect of a history of artificial immunization upon the incidence of positive Schick reactions. Recruits giving such a history were classified according to the interval since immunization, and the incidence of positive reactions compared. The results are given in Table 5. Similar studies were done on the groups giving a history of clinical diphtheria in the individual or among the members of his immediate family. The results are given in Tables 6 and 7. Admitting the probable inaccuracy of an unknown percentage of the histories, the figures as obtained did not show a marked correlation between the incidence of positive Schick reactions and the interval since

TABLE 5

Schick-positive Reactions by Year of Active Immunization Against Diphtheria

Year Immunized	No. Immunized	Schick-positive	
		No.	Percentage
1941	91	20	22.0
1940	247	43	17.4
1939	339	61	18.0
1938	369	66	17.6
1937	399	90	22.6
1931–1935	1,516	318	21.0
1926–1930	921	245	26.3
Before 1926	175	51	29.8
Unknown	94	27	28.7
Totals	4,551	997	21.9

TABLE 6

Schick-positive Reactions by Year of Occurrence of Clinical Diphtheria

Year	No. Cases	Schick-positive	
		No.	Percentage
1941	1	0	—
1936–1940	47	11	23.4
1931–1935	140	29	20.0
1926–1930	236	53	22.4
1921–1925	206	38	18.4
Before 1921	52	17	32.7
Date unknown	5	2	—
Total	686	140	20.2

TABLE 7

Schick-positive Reactions by Year of Exposure to Clinical Diphtheria in Family

Year	No. Cases	Schick-positive	
		No.	Percentage
1941	3	0	—
1936–1940	101	24	23.9
1931–1935	265	62	23.4
1926–1930	298	72	24.2
1921–1925	192	56	29.2
Before 1921	64	27	42.2
Date unknown	21	7	33.3
Total	1,044	248	23.8

the occurrence of any of these three events.

It is obvious that further statistical analysis is necessary before the significance of these figures can be assessed. Other factors which may be correlated with the incidence of Schick-positive reactions are being investigated. It is planned to supplement this brief preliminary report with a more detailed and complete analysis of all these factors.

SUMMARY

1. A Schick survey of 18,499 naval recruits revealed that 6,311, or 34.2 per cent, gave positive Schick reactions.

2. Of these 6,311 recruits presumably susceptible to diphtheria, 1,538, or 24.4 per cent, showed positive Moloney reactions when tested for sensitivity to diphtheria toxoid.

3. The incidence of susceptible recruits was significantly higher in men coming from the northern part of the United States as opposed to those coming from the southern part.

4. The percentage of recruits giving positive Schick reactions increased with age.

NOTE: This survey was carried out by the following medical officers: Capt. R. W. Babione, MC, USN; Cdr. F. A. Butler, MC, USN; Cdr. F. S. Cheever, MC, USNR; Cdr. J. N. DeLamater, MC, USN; Cdr. R. A. Mount, MC, USN; Cdr. O. F. Munch, MC, USNR; Lt. Cdr. L. R. Schoolman, MC, USNR.

Dental Health Education Services of the American Dental Association*

GLENNA G. WALTER

Dental Health Education Consultant, American Dental Association, Chicago, Ill.

THE American Dental Association has the responsibility of offering leadership and guidance in a dental health education program at a national level. Its dental health education services are planned as part of an integrated general health program, and emphasis on the need of accepting the responsibility for dental care is directed toward the individual, family, and community in that order.

The following objectives have been adopted by the American Dental Association for the national dental health program:

1. Help every American to appreciate the importance of a healthy mouth.
2. Help every American to appreciate the relationship of dental health to general health and appearance.
3. Encourage the observance of dental health practices, including personal care, professional care, proper diet, and oral habits.
4. Enlist the aid of all groups and agencies interested in the promotion of health.
5. Correlate dental health activities with all generalized health programs.
6. Stimulate the development of resources for making dental care available to all children and youth.
7. Stimulate all dentists to perform adequate dental health services for children.

Although the overall program for dental health education is directed toward the individual's responsibility and the facilities available in his particular community, the American Dental Association has established certain principles to govern the operation of this national dental health program.

These four principles act as a guide and a control from the national level:

1. *Research*—Adequate provision should be made for research which may lead to the prevention or control of dental diseases.
2. *Dental Health Education*—Dental health education should be included in all basic educational and treatment programs for children and adults.
3. *Dental Care*—
   a. Dental care should be available regardless of income or geographic location.
   b. Programs developed for dental care should be based on the prevention and control of dental diseases. All available resources should first be used to provide adequate dental treatment for children and to eliminate pain and infection for adults.
   c. Dental Health is the responsibility of the individual, the family, and the community in that order. When this responsibility is not assumed by the community, it should be assumed by the state and then by the federal government. The community in all cases shall determine its methods for providing services.
4. *Participation in Program Planning*—In all conferences that may lead to the formation of a plan for dental research, dental health education and dental care, there should be participation by authorized representatives of the American Dental Association.

The first responsibility of the American Dental Association in a national dental health program is to keep the members of the dental profession informed of the results of all scientific dental research, and the basic dental health concepts that are developed. An

* Presented before the Dental Health Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 9, 1947.

explanation of all phases of the dental health education program is presented to the professional membership, and they are encouraged to participate in the dental health education activities as part of an integrated general health program in their community.

The dental health planning workshops in the state and local dental societies have been organized to study the dental health problems in a particular area, and should be first in any discussion of what is being done by the American Dental Association in dental health education. These workshops are organized by the state and local dental societies with the assistance of the Council on Dental Health of the Association, and offer a means of coördinating the work of the local, state, and national councils on dental health. These workshops have been held in Ohio, New York, Louisiana, New Jersey, Georgia, Connecticut, and Minnesota. Illinois, South Dakota and Oregon plan to hold workshops within the near future.

The workshop offers an administrative framework for coördinating functions, but the Councils on Dental Health at the local and state level offer guidance and leadership in dental health education to the general health program of the community in the same manner that the Council on Dental Health of the American Dental Association offers guidance and leadership in dental health education to the national health program.

It is impossible for the present dental personnel to meet the present dental disease problem, and prevention through education is the only possible solution. The schools, established health and welfare agencies, allied professional societies, commercial companies, and service organizations have trained personnel who are usually qualified to present their particular type of service at the time and place most meaningful to the individual, and it seems important that dental health facts should be made available to these qualified people in a manner that can be most efficiently integrated into the general health services. It is with this thought in mind that most of the dental health education literature and activities are being planned.

Consultation services are available to official and voluntary agencies in the formation of policies for a practical and effective integration of dental health programs. It is hoped that this will prevent a feeling of being "told what to do"; but will give an opportunity for the individual to learn good dental health habits that are consistent with his particular problem and environment. The same opportunity is offered to the community; in studies of their own local dental health problems, and needed available factual information prepared to be used by the personnel of their own health services. In other words, each community, and each agency in the community has the privilege and responsibility of solving its own dental health problems; but professional guidance and factual information are made available for that purpose.

The dental health education program of the American Dental Association consists of two general services:

1. Advisory and consultative assistance in dental health education is provided free of cost to all component and constituent dental societies, departments of health and education, professional and lay organizations, commercial agencies, and to authors and publishers of school textbooks and magazines. This consultant service makes it possible to interpret present dental health concepts which are factually correct and consistent with scientific research to a group of people who have facilities for reaching a large segment of the population without employing a new tool or additional personnel in any one specialized field.

2. The second service is the production and distribution of dental health education aids, which include printed materials, films, film strips, and slides; magazine and newspaper articles; radio scripts and transcriptions, and exhibit materials. These dental health edu-

cation aids are distributed directly to the public, but it is preferable to supply them to an agency that can give the necessary motivating preparation and follow-up services to make the materials most meaningful to the individual and the community. There will be a limit on the number of pieces of material that can be obtained from the American Dental Association, but this is the result of keeping dental health information factually accurate and consistent with dental research. A definite nomenclature is being established for use in dental health literature, which will be helpful in all teaching procedures.

It is important that teachers and the personnel of all official or voluntary agencies who are participating in the teaching of dental health education should have had not only the opportunity to learn the basic dental health facts, but have also experienced good personal dental care.

The need for dental health education materials to be used in teachers' training schools, nurses' training schools, social service training divisions, and in all schools of public health as well as the materials needed immediately for inservice preparation of classroom teachers, school administrators, nurses and physicians, and other specialized groups are recognized by the dental profession and will be met as quickly as possible.

You will notice when you review the dental health education materials that are available from the American Dental Association that there are 3 dental health rules employed in all of the information distributed to the general lay public:

1. Visit your dentist at least every 6 months or as often as he recommends.
2. Eat an adequate diet, restricting refined carbohydrates, especially sugars. Emphasis is being placed on the limitation of soft drinks, candies, and chewing gum.
3. Brush your teeth properly and thoroughly immediately after eating. Special attention is being given to pointing up the fact that the dentist is the person who should determine the best method of toothbrushing for the individual mouth and prescribe the correct type of toothbrush and dentifrice to be used.

It is essential that these basic principles of dental health be understood and be made meaningful to every individual if we hope even to begin to control the problem of dental diseases. This can be done only by everyone coördinating his information and efforts with all of the facilities that are available in each community. The layman is extremely busy, and cannot be expected to spend much time or effort on lengthy reports, but will use a few facts that are presented to him time and time again. The assimilation of these facts into a satisfying experience will finally result in a desirable dental health habit. It is extremely important that good personal dental health habits are formed early in life.

Unfortunately, dental caries, which is the most prevalent dental disease, is always more rampant during youth. This is an age period filled with many more interesting and exciting things to do than conscientiously to follow a daily dental health routine for which little or no personal recognition is given. Irregular dietary habits, and the desire for confections at this age all add to the total lack of dental health in our youth.

Again, I want to say that this type of teaching must be done by personnel who have an opportunity for frequent contact with the individual whose attitude toward dental health is being influenced. Dental disease is not dramatic, and does not in most instances necessitate hospitalization. Therefore, it lacks much of the emotional appeal that is being used to stimulate interest in other diseases in a national prevention program. Dental diseases are slow, insidious processes and require a day-to-day attack.

Although dental disease is the responsibility of the individual, it must be recognized as a community public health problem, and all of our combined efforts are constantly required to attain the highest potential level of dental health—through dental health education.

International Trends in Health Care

JOHN B. GRANT, M.D., F.A.P.H.A.

International Health Division, The Rockefeller Foundation

DEVELOPMENTS outside North America in health care during the past decade have been almost revolutionary. Activity centers in European countries and in the British Commonwealth. In carrying out under the auspices of the International Health Division of The Rockefeller Foundation a preliminary survey of work and literature in the field of health care, twelve countries were visited. These countries were Australia, Canada, Denmark, England, Finland, France, The Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United States. In what follows an attempt will be made to reproduce the main impressions received during this travel and to give at the end a list of chief items in the literature.

In spite of the remarkable amount of work already done, there is not yet available a universally accepted definition of health care or any clear agreement on its scope and contents. At the outset, however, the International Health Division of The Rockefeller Foundation in arranging for the above mentioned survey was prepared to accept the following assumptions:

Health of mind and body is a basic human need. A healthful community is a basic social need. *Social Medicine,* which has as its aim the meeting of these needs, is committed to a program of curative and preventive measures for the protection of the individual and the community against whatever interferes with full development and maintenance of both mental and physical capacity. It is also prepared to advance beyond these measures to the promotion of positive health through application of sociological techniques and methods.

Social Medicine, Medical Care, or *Health Care* are so interchangeable as to be almost synonymous. Preference, following South African usage, should perhaps be given to the term *health care.*

Adequate Medical Care makes available to every individual in the community, without discrimination, all facilities of medical science necessary to achieve and maintain optimum health of mind and body.

The General Medical Council of Great Britain specifies more particularly that adequate social medicine aims "to seek and to promote measures, other than those usually employed in the practice of remedial medicine for the protection of the individual and of the community against such forces as interfere with the full development and maintenance of man's mental and physical capacity." Thus, medical care extends clinical medicine beyond clinical diagnosis to social pathology and therapy, thereby making it the task of medicine to assure a mentally and physically healthful community.

By any interpretation it is clear that the "full development and maintenance of mental and physical capacity" depends not only on adequate medical services but also on minimum standards of nutrition, housing, recreation, education, and social security. Acknowledgment of the importance of these nonmedical factors comes out clearly in the principles of policy adopted today by most organized medical professions, such as the first and last of the ten principles of the American Medical Association, stated in June, 1945, and restated in February, 1946, which are concerned with providing necessary nonmedical factors by community efforts and government aid, if it is not possible

to gain them by individual effort.[1] The South Africans have adopted the term health care in preference to medical care to emphasize the non-medical promotive and rehabilitative, as well as the medical preventive and remedial, essentials needed to arrive at full mental and physical capacity.

The provision of *medical* services depends upon three prerequisites. These are: removal of economic barriers; sufficient personnel and facilities, properly distributed; and, finally, a high degree of technical excellence in both medical personnel and equipment. Economic barriers to health care can be removed only through organized voluntary or compulsory measures. Medical personnel with adequate training must be available in sufficient numbers to deal with significant social and environmental conditions as well as clinical pathological symptoms. However, neither removal of economic barriers nor provision of adequate personnel suffices, unless there is a proper geographical distribution of both personnel and technological tools.

In deciding upon the scope of health care, two final generalizations should be taken into account. Effective measures for health promotion, disease prevention, and rehabilitation require government action and cannot be attained through voluntary initiative. This is possibly true even of curative medicine. Even in the United States some legislation is already on the statute books with respect to each of these four services, and Senator Taft's health insurance bill, limited as it is, would extend facilities for care beyond the public assistance group. The second generalization is that legislation should not be of a negative nature based on political grounds, generally due to considerations of labor, but of a positive nature based upon social-economic necessity to promote the quality of population.

The first stage of social welfare, developed a century and a half ago in England, consisted of paternalistic legislation largely to relieve outstanding ills. It was based solely upon humanitarian and philanthropic motives. All countries have passed this stage. The second period, developed some sixty years ago in Germany, dealt with social insurance. Such insurance was motivated by political considerations. The purpose was to provide security to labor by pooling risks through unemployment insurance. Most countries, including the United States, are in this second stage. The third stage is based squarely upon a population policy which aims to improve the quality of human capital by legislation directed toward removing the causes of social ills. Swedish, Danish, French, and, to a growing extent, Finnish legislation is now based upon recommendations of commissions considering the improvement of population. The report of the English Population Commission will appear in 1948.

It should be borne in mind that the component parts of legislation always vary with the economic philosophy of the political party enacting the legislation. The English Health Services Act of 1946 was inevitable with either a Labour or Conservative government in power, but the Conservatives would not have nationalized the hospitals. A health insurance act seems inevitable in the United States, but the Wagner Bill differs in shape from the Taft Bill.

The foregoing constituted the base line upon which the survey was made and by which trends were interpreted. The survey was concerned primarily with strictly medical trends, but note was also taken of essential developments in non-medical measures required for the maintenance of mental and physical capacity. The latter will first be briefly reviewed.

NON-MEDICAL FACTORS

1. *General Security*[2]—Strictly non-

medical social welfare legislation to provide security has, generally speaking, been enacted earlier and in more comprehensive form than legislation based upon medical or population considerations. Previous to 1937 Danish legislation was the most comprehensive, but Denmark has now been passed by New Zealand, Britain, and France, and shortly will be by Sweden. Thus, the English 1946 National Insurance Act [3] provides nation-wide coverage for old age and invalidity, widows and orphans, unemployment, workmen's compensation, and funerals, as well as cash benefits for illness. All of these countries now provide one or more of the foregoing to restricted population groups. Countries having nation-wide coverage, apart from medical services, legislate specifically to promote health. Such legislation provides family allowances, disability training, and various help for married women, including maternity benefits. Family allowances, except for the United States, are now universal. In England it is a matter of national interest to help parents to maintain their children. A substantial part of the benefits is given in kind through school meals and milk services, which cost the nation 60 million pounds a year. In addition, there are 69 million pounds for cash allowances. Individuals requiring refresher training as a part of disability rehabilitation are given an allowance in excess of unemployment benefit. Women receive a maternity grant of 4 pounds, and if gainfully employed, a maternity allowance of 36 shillings a week for 13 weeks. Women not eligible for the latter allowance receive an attendance allowance of a pound a week for 4 weeks to provide domestic help, in addition to the maternity grant. In France there is, in addition, an allowance during pregnancy. Publicly provided home-aid services constitute an important international post-war development.[4]

The amount of social security costs paid from insurance premiums varies in different countries from 40 to 70 per cent, the balance being met by funds derived from the general exchequer. The English social insurance costs including health for 1948 will require at least 10 per cent of the national income, while the South African estimate for 1955 is 15 per cent. The United States federal expenditures in 1946 on social welfare constituted 1.3 per cent of the national income. It is of interest to know that in addition to the general income tax, both New Zealand and Australia levy a special welfare tax of 1/6 on the pound.

2. *Housing* [5]— Measures more immediately promoting health deal with housing, nutrition, recreation, and education. There are two types of government housing policies, an older one based on rental returns and a newer one on population needs. Outside of North America, Holland is the only country where rental returns still predominantly determine government policy. The same policy is advocated in the Taft-Ellender-Wagner Bill. Sweden has evolved the clearest example of a policy determined solely on population needs with no reference to rental returns. This policy acknowledges that the majority of families cannot pay rentals high enough to yield a profit on the housing they require. Consequently, the Swedish Government, in addition to granting third mortgage loans up to 95 per cent of the value of the property, guarantees the interest on the first and second mortgage loans, and also supplements the third loan by tax subsidies. The government without a means test also underwrites from 30 to 40 per cent of the rent. The exact amount depends on the number of children. Housing policy in the other countries reveals a similar trend. Finland, Norway, and Denmark, although providing for rent allowances determined by the number of children, have certain

variations. For example, Denmark has an upper income bracket, the allowance is paid only after the third child, and the family must live in a state-designated house. In New Zealand less than 1 per cent of houses are built on a rent return basis, and government subsidies keep the maximum rental at 25 shillings a week. Even this is more than paid for by the family allowance of 10 shillings per child per week if there are three children in the family. There is increasing international acknowledgment that rentals should not exceed 20 per cent of the wage of the laboring group.

Every country now has a national housing agency, and a number have town planning agencies. Planning is much occupied with neighborhood units of 10,000 population, some of which provide for health centers. Research is an important feature in England, Holland, and Denmark. Housing has been related to health in international literature, but due to the initiative of the American Public Health Association,[6] the United States is the only country where such health standards have been specifically formulated.

3. *Nutrition*[7] — All European countries except Holland are establishing food policies resembling those already operating in Great Britain and Sweden. Among the items included in these policies are free or subsidized protective foods to specific population groups, enrichment of certain foods, free school lunches, price control backed by subsidies, and increased production of essential foods, particularly milk. None of the four nations of the British Commonwealth has, as yet, adopted an overall nutrition policy. South Africa, which has done so for a small percentage of its population, is an exception. However, all of the twelve countries to a greater or lesser extent provide school lunches.

4. *Recreation*—The need for mental, social, and physical recreation, acknowledged by the American Medical Association in its tenth principle, is increasingly provided for through community centers. The underlying principles illustrated by the Peckham Center[8] in England are that to enjoy physical and mental health the family unit must have normal social and biological outlets. These are available in rural agricultural communities, but not in industrial centers. The Peckham neighborhood unit, with its freedom of social activities and adequate admixture of families from different walks of life, permits spontaneous social-biological development, thus correcting maladjustments which make positive health unobtainable. Community centers are developing more rapidly in England than elsewhere because they became mandatory under the Education Act of 1944. South Africa has ambitious plans. The National War Memorial Health Foundation established by the veterans of the recent war is now soliciting 5 million pounds for a war memorial to take the form of 400 community centers similar to the Peckham experiment, to be erected beside each of 400 health centers in process of construction by the Ministry of Health.

5. *Education*[9] — Conventional health education of either the "propaganda" or the standard school instruction type is found to a greater or lesser extent in each country. The only effective departure from convention has been gradual introduction of the "workshop" technique in the United States and Canada, whereby representative lay leaders of the community under the direction of a trained individual discuss prepared material concerning medical care. During such a seminar, lasting one or more days, participants reach their own conclusions on what steps must be taken to meet community educational needs. These techniques have been most successful in Manitoba and in some of the

western states. The Farm Foundation and the Interbureau Committee of the U. S. Department of Agriculture, through its Farm Security Administration, are developing work of this pattern in various parts of the United States. The program is to have each agricultural college appoint a qualified worker who endeavors to have the surrounding area take the initiative in establishing prepayment plans for medical care, obtain personnel and facilities, and establish and strengthen local public health units. Presumably health departments should extend the scope of their educational activities to cover the field of medical care.

The most significant of the foregoing "non-medical" trends is to make population policy [10, 7] a determining factor in welfare legislation. Such policies are still largely empirical and will not become scientific until disciplines are developed in social physiology, pathology, and therapy, directed specifically toward the development of the mental and physical capacity of man in relation to his environment and his community. This scientific development is a responsibility which universities are only just now beginning to undertake. University leadership could be achieved through an extension of the existing medical and other university disciplines, with a sound biostatistical approach, into such social sciences as anthropology.

MEDICAL FACTORS

It has been stated that the adequate provision of medical services for prevention of disease, cure of illness, and rehabilitation of disability requires removal of any economic barrier; adequate and geographical distribution of medical facilities and personnel; and a high technical excellence of the personnel and their tools. Recent legislative trends and thinking in these three essentials during the past decade display an almost revolutionary trend.

The overall international legislative picture is summarized in "Health Insurance, A Report of the Canadian Parliamentary Committee on Health Insurance." [11] A recent summary of Northwestern Europe is given in two U. S. Public Health Reports.[12]

1. *Economic Barriers*—Denmark is the only country which for a majority of its population over a decade ago provided medical care, largely on a "voluntary" basis.[13] The other Scandinavian countries, while giving practically nation-wide hospitalization, were providing medical services to only a part of their populations, chiefly through mutual aid societies. The situation is changing very rapidly. New Zealand, beginning in 1938, enacted legislation which now provides comprehensive care, including free hospitalization, on a nation-wide basis for all services except specialists.[14] The Germans during their occupation of Holland put through forcibly compulsory insurance for a comprehensive service based on a means test. France, as of January, 1947, inaugurated universal coverage as comprehensive as that of any other country.[15] A similar Health Services Act in the United Kingdom is due to be inaugurated July, 1948.[16] A similar Swedish Act begins operation in 1950. The South Africans and Australians, since the war, have provided nation-wide, tax-supported hospitalization as a first step in a planned, and comprehensive nation-wide coverage. The Finns also, since the war, are proceeding to provide this as rapidly as their special economic circumstances will allow. Norwegian legislation is in the drafting stage. Canada published in 1945 its White Paper [11] for comprehensive national health insurance, approved by its Medical Association. Failure of implementation has been due chiefly to broad non-medical economic factors relating to the division of fiscal powers between the Dominion and the Provinces. In the meantime,

Saskatchewan has inaugurated compulsory hospital insurance. Here in the United States there are the recurring and pending Wagner and Taft Bills, while the Hospital Survey and Construction Act [17] is already law.

The only two countries in which insurance on a voluntary basis continues to receive consideration are Denmark and the United States. Insurance in Denmark is in reality only partially voluntary, because hospitalization for the 100 per cent population covered is entirely tax-supported, and medical services for the 80 per cent covered through the friendly societies are supported more than 60 per cent by taxes. It is stated that in the United States as of July 1, 1947, there were twenty-seven million enrolled under Blue Cross hospitalization plans, and six million enrolled under fifty-six medical society-sponsored plans. Membership in the latter is generally restricted by income level, and coverage is limited. It is estimated that some nine million persons carry commercial indemnity insurance for more or less limited coverage. The details of the present trend for medical care in this country are extensively reviewed in *Medicine in the Changing Order* [18] and *Blue Cross and Medical Service Plans*.[19]

It is now anticipated that Britain's comprehensive medical care coverage will cost 200 million pounds for 1948–1949, or approximately $20 per capita. The premiums received from insurance will meet less than one-third of the cost.

Britain's national income and total government expenditures for the year ending March 31, 1946, were approximately 5,500 million pounds each. Expenditures for the same period for social security and welfare, exclusive of education, were a little over 500 million pounds. Because of the large military expenditures included in this period in the total government expenditures, the proportion given to social security and welfare is perhaps not that of a typical year. For a population of 1.7 million, the approximate 1944 figures for New Zealand were, for national income 300 million pounds; government expenditures, 100 million pounds; social security, including medical, 43 million pounds; and health coverage, 7 million pounds—the latter being in the range of $13 per capita, with the New Zealand pound reckoned at $3.25.

England, Denmark (mainly), and the Netherlands provide a capitation basis for paying general practitioners. Specialists are paid either through part-time salary or, more commonly, on a fee-for-service basis. In England they will be paid entirely on a part- or full-time salary basis. France and Sweden require that the insured person bear a part of the cost of the medicine and services provided by the general practitioner.

Three major defects in the planning of legislation for medical services seem common to the countries visited. The most serious is the complete failure, except in regard to physicians in Australia, to consider the categories and number of personnel required and the training needed to implement the organization envisioned by legislation. Second, except in South Africa, planning and legislation are for sickness rather than health insurance. Third, invariably there is inadequate provision for the three chief lags in medical care today: chronic, mental, and rehabilitative services. In addition, there are two minor defects. Planning in most countries has gone ahead in water-tight compartments without adequate reference to what is developing in other countries. Generally speaking, such observers as were sent abroad saw only established activities and overlooked the embryonic developments, which in ten years will establish the unmistakable pattern of tomorrow. Also there is almost complete disregard of the need for auxiliary medical personnel. The

United States, and, to a lesser extent, Canada are the only countries where the training of auxiliary medical personnel in all categories, except practical nursing, has become standardized, with the level of training controlled by a national organization. Similarly, these two countries are the only ones where hospital administration with regard to standard records, etc., has reached a level at all satisfactory.

One was struck by the preoccupation of national health administrators with medical services and legislation, to the exclusion of general health problems. This is true in spite of the backwardness of a number of countries in nonpersonal general services, environmental health and epidemiology, including laboratory diagnostic services. There is not enough recognition in these countries that a successful medical care program can be reared only on the foundation of an adequate public health program.

2. *Geographical Distribution of Facilities and Personnel*—The chief aspects to be considered are regionalization of institutions, bed requirements, numbers and function of health centers. Adequate regional distribution of institutional facilities is a need which has been increasingly accepted since the publication of "Future Provision of Medical and Allied Services"[20] by the British Ministry of Health in 1920. This report is the basis for "Health Services Areas"[21] and other national planning proposals,[22] including the official recommendations of a number of medical associations. Regionalization is enacted in the British Health Services Act (1946)[16] and constitutes the chief basis of the recent report, *Hospital Care in the United States*.[23] France also has a scheme now being implemented for the national regionalization of hospitals and health centers very similar to the English plan.[24] The Scandinavian countries, beginning with Denmark (1925), have zoned hospitals to give each designated region smaller "mixed" hospitals as well as a "central" hospital possessing medical and surgical departments with diagnostic facilities. But there has been no organization for the coördination described in the American experiments.

The overall pattern in different countries is similar. Efficient regionalization provides for institutions at three to four levels, the health centers at the periphery stemming back through community and district hospitals to a coördinated base, which preferably should be a teaching institution. There should be a two-way flow between base and periphery, which assures routine services at each level for diagnosis, consultations, and continuation education. However, no country has as yet an example of such fully coördinated regionalization. If one were available, it would constitute a most potent factor in bringing about more adequate medical care.

Three significant experiments toward this end are now in process in the United States under the auspices of the Bingham Associates,[25, 26] Boston; the Council of Rochester Regional Hospitals,[27] Rochester, N. Y.; and the Michigan Community Health Program.[28] Foremost trends and experiments are summarized in "The Health Department and Medical Care — Certain Trends."[29] The most discussed physical aspects of regionalization are the number of beds and health centers required in terms of population units.

The overall pattern emerging from these three experiments has remarkable uniformity: A regional group of hospitals expresses an interest in associating with a teaching base hospital. The local diagnostic facilities are surveyed and strengthened both as to equipment and personnel. The technicians in the smaller hospitals are supervised by full-time specialists at the designated larger hospital. Qualifications for medical staff membership are laid down. The hospital service is departmentalized at

least into medicine and surgery, and assistant residents from the base inaugurate teaching ward rounds. A teaching resident is made available for one or more hospitals. As a result, central pathological conferences are instituted at routine periods, supplemented by special teaching clinics, which may or may not be conducted by specialists from the teaching base. Further steps are the inauguration of continuation education for the local medical practitioners and the institution of graduate training for specialists. The affiliated hospital meets the requirements of the board of the specialty in which training is to be given. The assistant resident proceeding to the teaching base in the second year for training in the basic sciences is replaced by an assistant resident from the teaching center. The candidate returns to the parent hospital for his third or additional resident years. As an additional feature the teaching hospital provides consultations in the regional hospitals and also "refresher" courses at the base, extended gradually to all categories of personnel besides physicians. The scheme, when complete, establishes satisfactory diagnostic services and continuation and graduate education.

Hospitals—Discussion of the number of beds required has resulted in a special bibliography. In what follows some of the more important English references are noted. Most of the figures are derived empirically. The two most careful overall studies of requirements are those of the Hospital Council of Greater New York [30] and of the Commission on Hospital Care.[23] The latter bases requirements on a bed-death ratio. This ratio varies from community to community, but offers a better guide for planning than empirical results or experiences based on actual hospital days, as used by the Committee on the Costs of Medical Care.[31] The total of 16.1 beds per 1,000 population (Table 1) taken from the Report of the Hospital Council of Greater New York is of particular interest in view of the goal of 15 beds arrived at empirically in several countries.

TABLE 1

	Beds per 1,000 Population
General Care	
Residents	4.0
Non-residents	0.2
Convalescent Care	1.0
Long-term Illnesses	2.0
Acute Communicable Diseases	0.1
Tuberculosis	0.8+
Psychiatric Patients	8.0
	16.1+

The distribution of "general" beds is given in several of the references, particularly the Gluckman Report,[32] the Australian Parliament's Joint Committee on Social Security, "Sixth Interim Report," [33] and the British Hospital Surveys.[34] The population required to support adequate facilities in such clinical specialties as malignant diseases, neurosurgery, plastic surgery, thoracic surgery, etc., range from one to two million, as noted in the Australian report, the British Hospital Surveys, and the master plan of the Hospital Council of Greater New York.[30] The British have tentatively set up the following special service standards for a 2,000,000 population unit:

1 Radiotherapist ..... per 130 beds
1 Thoracic surgeon ..... per 60 beds in tuberculosis institutions

The institutional facilities required to remove the third major lag in medical care, referred to above, have recently begun to be explored. The principle that beds for mental, chronic, and rehabilitation services should in general be associated with general hospitals is the chief development.[23, 33] The specific requirements for mental facilities are best set forth by Blacker,[35] the American Psychiatric Association,[36] and the U. S. Public Health Service.[37] Provision for long-term illnesses are barely in process of formulation, except for the generally accepted quota of two beds per 1,000 population.[38, 39] The most systematic

proposals are probably those recommended by the New York State Health Preparedness Commission.[40] The importance of the problem of rehabilitation is evident from the general legislative provisions in both Britain[41] and the United States,[42] particularly the former. One of the best statements of specific requirements is the Baruch Report,[43] amplified by Kessler in *Rehabilitation of the Physically Handicapped*.[44] Denmark was one of the earliest countries to develop rehabilitation, particularly in connection with its invalidity insurance. The law requires that individuals with disabilities which may cause loss of working ability must be referred to an invalidity insurance court, which in turn refers patients to orthopedic centers with occupational therapy departments attached.[13]

The United States is well in advance in establishing standards for hospitals. Much of the credit is due to the pioneering work of the American College of Surgeons, whose *Manual*[45] and *Scoring Report*[46] repay consultation. An invaluable reference text is MacEachern's *Hospital Organization and Management*.[47] Another reference is the American Medical Association's "Essentials of a Registered Hospital."[48]

Health Centers—The quality of health care in any community will eventually be determined by and through health centers. The bibliography on this type of institution reflects its evolutionary state.[1, 20, 21, 49-56] Planning for this institution as a medical service center has progressed further in the British Commonwealth than elsewhere, and attention is drawn to the discussions of Stark Murray,[49] the Socialist Medical Association,[50] Parry,[53] the Society of Medical Officers of Health,[54] and particularly Gale[52] for details of function and scope. Even the eighteen specific medical and health care services enumerated by Stark Murray fall short in that they omit essential promotive and preventive activities. The size of the population to be served may vary widely between urban and rural conditions. It will be noted that the upper limit for the former is generally given as between 20,000 and 25,000 people. Parry's 10,000 unit is determined by the volume of personal health services alone, while the chief factor in the larger unit would seem to be the optimum number of general practitioners constituting a satisfactory group, generally given as 8–10. It is generally considered that services should be available within a radius of half a mile, and it is this factor in urban areas which requires neighborhood centers radiating from divisional centers. The latter would be intermediary to the affiliated hospital. National town planning agencies have been established in a number of countries, and it is of interest to note the coincidence that populations of 10,000 are recommended for "primary" neighborhood units. Again, however, nowhere is there an example of a health center exemplifying fully the total scope envisaged eventually for this institution. The international significance of such a health center as a demonstration would quickly become evident.

The rural health center has received less consideration than the urban. The U. S. Hospital Survey and Construction Act[17] provides one per 30,000 population, except in areas with fewer than 12 persons per square mile, which are to have one per 20,000 population. While not entirely comparable, it is of interest to note that Australia,[33] with its sparsely distributed rural population, aims to provide 760 centers with at most two physicians for a population of approximately 2,800,000, or one center per 3,680 persons. The proposed "workshop" of the "municipal physician" in rural Western Canada covers on the average a population of less than 3,000. A planned experimental rural health center is about to be inaugurated by the Rown-

tree Trust (York, England) for a population of 10,000. Two of the most successful medical services for rural areas are the Highlands and Islands Medical Service in Scotland [57] and the more recently inaugurated district and regional service in Tasmania.[58]

The medical service concept of a health center raises the question of "group" or "partnership" clinics. Consequently, one awaits with more than usual interest the forthcoming reports on this emerging aspect of medical practice by the U. S. Public Health Service and by the British Medical Association respectively. The U. S. Public Health Service has published three preliminary reports.[59]

Ambulatory Services—While considerable progress has been made as to institutional bed requirements for medical care, there are surprisingly few data, as may be noted in the bibliography,[60-63] on the facilities and personnel required for good ambulatory medical or, better still, health care services. And these few are limited to "demands" as distinct from "needs" for services. One may well query whether "needs" will be definable before scientific disciplines of social physiology and of pathology have established norms and deviations as base lines for satisfactory ambulatory services. In the meantime, one may expect increasingly accurate measurements of "demands." A significant step toward the latter is the new international classification of causes of morbidity.[64] When medical school hospitals, such as those of New York University, Johns Hopkins, and the regional teaching hospitals in Britain, are associated with prepaid medical care population units, it is anticipated that one of their chief lines of investigation will be to determine demonstrable standards for adequate medical and health care, including preventive and particularly promotive health services. Requirements for the two latter are now mainly on an empirical, if not an out and out hypothetical, basis.

3. *Medical Personnel—Numbers and Training*—The rapid advances in medical knowledge, and particularly technology in the past quarter century, have brought into existence auxiliary medical workers supplementing physicians, dentists, and pharmacists. These are considered essential to adequate medical care. Apart from nurses, they now include both medical and psychiatric social workers, dietitians, occupational therapists, physical therapists, medical record librarians, medical and dental laboratory technicians, x-ray technicians, and dental hygienists. The United States and Canada are the only countries in which the qualifications and registration of each type of auxiliary medical worker are as well controlled as in the practice of medicine and dentistry. Other countries regulate one or more categories, but not all, and in several countries some categories are entirely lacking. Despite extensive legislation, there will not be adequate medical care in any country until auxiliary workers are provided in sufficient numbers and their training and supervision well organized.

Nursing is so far the only profession in which numerical requirements have been determined from job analyses. The estimates for other groups are determined to a greater or lesser extent on an empirical basis. Those for pharmacists, physical and occupational therapists (except in the mental field), medical record librarians, and practical nurses have not been determined even empirically. A considerable bibliography has developed for the other professions, particularly for physicians.

The following figures, with the exception of English [34, 35, 71] and Australian [39] estimates on physicians, are from United States sources. The most informative United States references are "Measuring the Community for a Hospital," [65]

PHYSICIAN REQUIREMENTS

Mean

	Population
1 General practitioner	to 1,500
1 Surgeon	to 10,000
1 Eye, ear, nose and throat	to 15,000
1 Internist	to 30,000
1 Gynecologist and Obstetrician	to 20,000
1 Pediatrician	to 30,000
1 Roentgenologist	to 60,000
1 Pathologist	to 100,000
1 Urologist	to 65,000
1 Orthopedist	to 100,000
1 Dermatologist	to 100,000
1 Psychiatrist	to 100,000

NOTE: Physician's services are calculated at the rate of 2,000 hours per annum.

DENTAL REQUIREMENTS

Mean

	Population
Dentists	99 per 100,000 *
X-ray Technicians	27 per 100,000
Hygienists	45 per 100,000
Laboratory Technicians	18 per 100,000

* Provided there is an auxiliary staff. Lee Jones is the authority for this estimate.

The American Hospital[66] and the American College of Surgeons *Hospital Standardization Scoring Report*.[46] The figures presented are no more than an approximate mean of available empirical estimates. The general purpose is to draw attention to the need of basing legislative planning on estimates of personnel requirements. These figures are not to be taken as recommendations. Also, it is obvious that personnel requirements must vary considerably from country to country. Requirements in specialized fields will differ from those in the general medical and surgical fields and are not presented in this general discussion. Estimates are given in the cited bibliography. The important point to be borne in mind in formulating requirements for personnel is that increasing coördination of services and group practice, made possible through growth of prepayment for medical care, will result in a decrease of the present requirements because of the greater efficiency which follows planned and coördinated services.

NURSING REQUIREMENTS

The *Manual of the Essentials of Good Hospital Nursing Service*[70] suggests methods of measuring norms for staffing a ward unit.

1. The average number of bedside nursing hours required per patient during each 24 hours:

	Hours
Medical, surgical, and mixed, ward and semiprivate	3.2
Maternity, ward and semiprivate	4.2
New-born, ward and semiprivate	2.3
Infants, ward and semiprivate	5.5
Older children, ward and semiprivate	4.3
Communicable disease, ward and semiprivate	4.7
Mixed, private patients	5.4
Maternity, private patients	6.5

2. The relationship of graduate bedside nursing hours to student bedside nursing hours:

	Per cent
Medical, surgical, and mixed, ward and semiprivate	31
Maternity, ward and semiprivate	51
New-born, ward and semiprivate	61
Pediatric, ward and semiprivate	12
Communicable disease, ward and semiprivate	37
Mixed, private patients	91
Maternity, private patients	86

3. The number of patients per day supervisor:

	Patients
Medical and surgical, ward and semiprivate	70
Maternity, ward and semiprivate	67
New-born, ward and semiprivate	82
Pediatric, ward and semiprivate	47
Medical and surgical, private patients	62
Maternity, private patients	50

Other interesting data than those tabulated in this study indicate that in the medical hospital an average of 6.7 staff nursing hours were required per operation, 46 per cent of which were graduate hours and 54 per cent student hours; and, that, moreover, there was a ratio of one head nurse to 5.5 operations and of one supervisor to 15.7 operations.

The type of patients admitted influ-

ences the nursing ratio. Hospitals caring for ambulant, convalescent, and chronic patients may give adequate care on the basis of a ratio as low as one nurse to 60 patients, although this is exceptional. In the extremely active hospital a ratio of 1 nurse to 1, 1½, or 2 patients may be necessary.

OTHER ANCILLARY PERSONNEL REQUIREMENTS

1. Medical Social workers	1 per 200 general hospital admissions or 2,000 outpatients (per annum)
2. Psychiatric Social Workers	2 or 3 to each psychiatrist or 1 per 500 outpatients (per annum)
3. Dietitians	1 to each 100 occupied beds
4. Clinical Laboratory and X-ray Technicians	1 to each 100 beds
5. Occupational and Physical Therapists	(Estimated only for mental and rehabilitation. See references.)

Requirements of public health personnel for the United States and Canada are discussed in *Local Health Units for the Nation.*[72]

Training and Registration of Personnel—The following standards for the training and registration of personnel are drawn entirely from United States sources, which, because they are more comprehensive, best serve the illustrative purposes of the paper. Wherever equal or higher standards of training and registration prevail, the United States illustrations will not be relevant. Certain British references are included[73, 74] as useful in countries which have not yet evolved minimum standards of training and of registration.

The American Medical Association is responsible for continuous revision of minimum essentials with respect to acceptable medical schools,[75] approved graduate schools,[76] internships,[77] residencies and fellows,[78] basic science instruction in residencies,[79] and approved examining boards in specialties.[80]

The American Dental Association is responsible for minimum essentials with respect to acceptable dental schools,[81] internships and residences,[82] schools for dental hygienists and technicians,[81, 83] and approved examining boards.[84] Similarly, the American Council on Pharmaceutical Education has set standards of accreditation of Colleges of Pharmacy.[85]

Standards for nursing are controlled by the National League of Nursing Education.[86]

The most recent category of personnel to emerge, for which training for accreditation is now being systematized, is the hospital administrator. The diploma covers one year of academic work and one year of supervised hospital practice. The minimum requirements for the former have not as yet become standardized, but a suggested manual for the hospital year has been worked out.[87] Registration is with the American College of Hospital Administrators, whose requirements are still entirely on an *ad hoc* basis.

The training requirements for other categories of medical care personnel can conveniently be tabulated. Each has a national association responsible for setting minimum standards and for registration. An exception is the National Association for Practical Nurse Education, which is in process of establishment.[88-90]

The Committee on Professional Education of the American Public Health Association is responsible for periodic revision of qualifications for the following categories of public health personnel; health officer,[99] medical administrator,[100] school physician,[101] public health dentist,[102] industrial hygienist,[103] public health nurse (including industrial),[104] health educator,[105] public health laboratory worker,[106] public

TRAINING REQUIREMENTS (U.S.A.)

Auxiliary Medical Workers

Profession	*Prerequisite*	*Training*
1. Medical [91] and Psychiatric Social Workers [92]	4 years' college	1 academic year, graduate 1 year practice
2. Dietitians [93]	4 years' college	1 year practice
3. Occupational Therapists [94]	1 year college	2 academic years' theory 1 year practice
4. Physical Therapists [95]	2 years' college	1 year
5. Medical Record Librarians [96]	2 years' college	1 year theory and practice
6. Laboratory Technicians [97]	2 years' college	1 year
7. X-ray Technicians [98]	High school	2 years' theory and practice

health statistician,[107] nutritionist,[108] and public health engineer.[109]

THE PATTERN OF TOMORROW

The foregoing trends furnish us glimpses of the pattern future health services will undoubtedly assume. Any economic barrier to adequate medical care will be removed through either voluntary or compulsory insurance. The distribution of health care will be increasingly improved through institutions in regional areas based, as far as possible, on teaching hospitals, integrated with non-teaching hospitals and health centers. A two-way flow from the health center at the periphery to the teaching hospital at the base will assure (a) adequate social and clinical pathological diagnostic services throughout the area; (b) routine continuation education for all categories of personnel in hospitals of more than 50 beds, which for physicians would imply teaching ward rounds, central pathological conferences, special teaching clinics, as well as adequate libraries and records; and lastly, (c) graduate instruction for designated categories of personnel. Adequate services for chronic, disabled, and psychosomatic patients will have been attained.

In the future the general practitioner will find it increasingly to his advantage to practise in groups in health centers providing diagnostic facilities and ancillary personnel, as well as ready consultation with fellow practitioners. As already recommended by several national medical associations, the family, rather than the individual, will be the unit of practice. A reoriented medical education will extend the practice of the general practitioner beyond his present clinical diagnosis and therapy to include most of the personal health services now rendered by health departments. He also will be responsible for prescribing measures required for the protection of the individual and of the community against such forces as interfere with development and maintenance of full mental and physical capacity.

The chief factor in rapid establishment of this pattern is the degree of aptitude of the medical profession, and especially of the general practitioner who serves as the quarterback of the medical team, in providing community family health care. The development of this aptitude requires the reorientation and extension of medical education to include social as well as clinical pathological diagnosis. A trend toward integrating social environmental and clinical instruction is already discernible. Some 27 schools in the United States now have varying degrees of clinical integration, in the manner which has already been described. Although a great step forward, this integration is too often of a negative nature because the activities practised are

limited chiefly to steps taken after disease occurs. Few relate to health promotion. The latter, generally speaking, cannot be undertaken effectively until there is prepayment in some form to provide promotive, preventive, and rehabilitative services.

Also, the rapidity with which medical education becomes reoriented will depend on the extent to which social medicine is accorded the same academic recognition and facilities for investigating and teaching social physiology, pathology, and therapy that is now provided for clinical physiology, pathology, and therapy. The immediate problem in reorientating the future general practitioner is to give him the same level of clerkship and internship in social as in clinical medicine.

The prime essential is, therefore, the provision of the health care facilities in a community as much under professorial administration as are the clinical laboratory and hospital facilities in other fields. The availability of medical school-controlled health centers is as essential for the teaching of social medicine as hospitals are for clinical medicine. In this respect there are two significant developments taking place in the United States. Medical schools are organizing themselves to promote comprehensive health care on a prepayment basis to groups in the community, and at the same time making the group clinics available for teaching purposes. The inauguration of the Health Insurance Plan of Greater New York has led New York University to establish a group clinic to provide comprehensive medical care. Other schools in New York are planning to follow suit. Recently medical care of the indigent in Maryland was transferred from Welfare to the State and Baltimore City Health Departments. The two medical schools in Baltimore are organizing health centers within their premises to provide health care to the people in their own areas.

Because the English Health Act provides for a comprehensive medical service on a prepayment basis, a unique opportunity is arising to explore and demonstrate the positive aspects of health care. Two medical centers in England are now experimenting in regard to control of the medical care facilities in their adjacent communities, including health centers. These two institutions are the Department of Social Medicine and Public Health at the University of Manchester and a group associated with London University. A University Health Center Planning Committee has been established under the chairmanship of the London School of Hygiene, associated with University College Hospital and the Child Health Institute, together with the London County Council and the British Medical Association. It is of interest to note that, at a recent meeting of an informal group of British professors of medicine, this health center requirement for the teaching of social medicine was discussed in considerable detail. A tentative conclusion reached was that one general practitioner and his team of required ancillary workers should be available for each clerk or intern in social medicine.

With the components of the general pattern clearly emerging here and there, the time in several countries is ripe for a further consolidation. The pump is primed. This was not true even ten years ago. The universal establishment of this pattern of health care as a "social science in the service of society" would usher in a new and momentous era in human welfare.

BIBLIOGRAPHY

1. American Medical Association. National Health Program of the American Medical Association. *J.A.M.A.*, 130, 8:494–496 (Feb. 23), 1946.

2. Robson, W. A., Ed. *Social Security*. London: George Allen & Unwin, Ltd., 1945.

3. Great Britain. *National Insurance Act, 1946, 9 & 10 Geo. 6 Ch. 67*. London: H. M. Stationery Office, 1946.

4. International Labour Office. Home Aides Services. *Internat. Labour Rev.*, Geneva, LVI, 1:39–46 (July), 1947.

5. Simon, E. D. *Rebuilding Britain—A Twenty Year Plan.* London: Victor Gollancz, Ltd., 1945.

6. American Public Health Association, Committee on the Hygiene of Housing. *Housing for Health.* Lancaster, Pa: The Science Press Printing Company, 1941.

American Public Health Association, Committee on the Hygiene of Housing. *An Appraisal Method for Measuring the Quality of Housing.* Part I. Nature and Uses of the Method. New York: A.P.H.A., 1945. Part II. Vol. A. Survey Director's Manual; Vol. B. Field Procedures; Vol. C. Office Procedures. New York: A.P.H.A., 1946.

Winslow, C.-E. A. Health Goals for Housing. *A.J.P.H.*, 37, 6:653–662 (June), 1947.

7. Schultz, T. W., Ed. *Food for the World.* Chicago: University of Chicago Press, 1945.

8. Pearse, I. H., and Crocker, L. H. *The Peckham Experiment.* London: George Allen & Unwin, Ltd., 1943.

9. Derryberry, M. The Role of Health Education in a Public Health Program. *Pub. Health Rep.*, Washington, 62, 46:1629–1641 (Nov. 14), 1947. Government Printing Office.

10. Myrdal, A. *Nation and Family.* London: Kegan Paul, Trench, Trubner & Co., Ltd., 1945.

11. Canada, House of Commons, Special Committee on Social Security. *Health Insurance—Report of the Advisory Committee on Health Insurance Appointed by Order in Council P.C. 836, Feb. 5, 1942.* Ottawa: Government Printer, 1943.

12. Mountin, J. W., and Perrott, G. St. J. Health Insurance Programs and Plans of Western Europe. *Pub. Health Rep.*, Washington, 62, 11:369–99 (Mar. 14), 1947. Government Printing Office.

Perrott, G. St. J., and Mountin, J. W. Voluntary Health Insurance in Western Europe. *Pub. Health Rep.*, Washington, 62, 21:753–67 (May 23), 1947. Government Printing Office.

13. *Social Denmark.* Copenhagen: Socilat Tidsskrift, 1945, pp. 68, 206, 318, 325–327.

14. New Zealand, Department of Internal Affairs, Historical Branch. *Introduction to New Zealand.* Washington: New Zealand Legation, 1945.

New Zealand. *Social Security Act of 1938 and Amendments and Regulations of 1939, 1940, 1941, 1942, 1943, 1944, and 1946.* Wellington: Government Printer.

15. France, Ministére du Travail et le la Securité Sociale. *Notes Documentaires et Études,* Nos. 450 et 451 (Série Française CXIII et CXIV), La Securité Sociale en France. Paris: Ministeré du Travail, 1946.

16. Great Britain. *National Health Service Act, 1946.* London: H. M. Stationery Office, 1946.

17. United States. *Hospital Survey and Construction Act, Public Law 725, 79th Congress, August 13, 1946.* Washington: Government Printing Office, 1946.

18. The New York Academy of Medicine, Committee on Medicine and the Changing Order. *Medicine in the Changing Order.* New York: The Commonwealth Fund, 1947.

19. Reed, L. S. *Blue Cross and Medical Service Plans.* U. S. Public Health Service. Washington: Government Printing Office, 1947.

20. Great Britain, Ministry of Health, Consultative Council on Medical and Allied Services. *Interim Report on the Future Provision of Medical and Allied Services.* London: H. M. Stationery Office, 1920.

21. Mountin, J. W., Pennell, E. H., and Hoge, V. M. Health Service Areas, U.S.P.H.S. *Bull. No. 292.* Washington: Government Printing Office, 1945.

22. U. S. Public Health Service, Hospital Facilities Section. Various reports and studies. Washington.

23. American Hospital Association, Commission on Hospital Care, *Hospital Care in the United States.* New York: The Commonwealth Fund, 1947.

24. Bridgman, R. F. Un Plan Français de Réorganisation Hospitaliére. *Techniques Hospitaliéres,* Paris, 10 and 11 (July-Aug.), 1946.

25. Proger, S. Distribution of Medical Care. *J.A.M.A.*, 124, 13:823–826 (Mar. 25), 1944.

26. Proger, S. Medical Education and Medical Care. *Hospitals.* Chicago, 20, 4 (Apr.), 1946.

27. Council of Rochester Regional Hospitals. *The First Year's Experience—1946.* Rochester, N. Y., 1947.

28. Wilkinson, C. F., Jr. Hospitals' New Role as Michigan Decentralizes. *Hospitals,* Chicago, 21, 2 (Feb.), 1947.

29. Grant, J. B. The Health Department and Medical Care—Certain Trends. *A.J.P.H.* New York, 37, 3:269–275 (Mar.), 1947.

30. The Hospital Council of Greater New York. *The Master Plan for Hospitals and Related Facilities for New York City.* New York, 1947.

31. Committee on the Costs of Medical Care. *Medical Care for the American People—the Final Report.* Chicago: University of Chicago Press, 1932.

32. Union of South Africa. *Report of the National Health Services Commission.* Pretoria: Government Printer, 1944.

33. Commonwealth of the Parliament of Australia, Joint Committee on Social Security. *Sixth Interim Report.* Canberra: Commonwealth Government Printer, 1943.

34. Great Britain. Hospital Survey, *The Hospital Services of London and Surrounding Area;* Hospital Survey, *The Hospital Services of Berks., Bucks., and Oxon.;* Hospital Survey, *The Hospital Services of the Eastern Area;* Hospital Survey, *The Hospital Services of the South-Western Area;* Hospital Survey, *The Hospital Services of South Wales and Monsmouthshire;* Hospital Survey, *The Hospital Services of Sheffield and East Midlands Area;* Hospital Survey, *The Hospital Services of the West Midlands Area;* Hospital Survey, *The Hospital Services of the Yorkshire Area;* Hospital Survey, *The Hospital Services of the North-Western Area.* London: H. M. Stationery Office, 1945. Hospital Survey, *The Hospital Services of the North-Eastern Area.* London: H. M. Stationery Office, 1946.

Nuffield Provincial Hospitals Trust. *The Hospital Surveys—The Domesday Book of the Hospital Services.* Oxford: Oxford University Press, 1946.

35. Blacker, C. P. *Neurosis and the Mental Health Services.* London: Humphrey Milford, 1946.

36. American Psychiatric Association. Standards for Psychiatric Hospitals and Out-Patient Clinics Approved by the American Psychiatric Association. *Am. J. Psychiat.*, New York, 102, 2:264–269 (Sept.), 1945.

37. U. S. Public Health Service. Standards for Psychiatric Training and Clinics. *Pub. Health Rep.*, Washington, 61, 26:943–956 (June 28), 1946.

38. The Hospital Council of Greater New York. *The Bulletin,* New York, 3, 8 (Aug.), 1947.

39. Great Britain, British Information Services. *Rehabilitation in Great Britain—I.D. 455.* New York, 1947.

40. New York State Health Preparedness Commission. Program for the Care of the Chronically Ill in New York State. *Legislative Document (1947) No. 69.* Albany, 1947.

41. Great Britain. *Disabled Persons Employment Act, 1944.* London: H. M. Stationery Office, 1944.

42. United States. *Vocational Rehabilitation Act, Public Law 113, 78th Congress, July 6, 1943.* Washington: Government Printing Office, 1943.

43. The Baruch Committee on Physical Medicine. *Report on a Community Rehabilitation Service and Center.* New York, 1946.

44. Kessler, H. H. *Rehabilitation of the Physically Handicapped.* New York: Columbia University Press, 1947.

45. American College of Surgeons. *Manual of Hospital Standardization.* Chicago, 1945.

46. American College of Surgeons. *Hospital Standardization Scoring Report.* Chicago, 1947.

47. MacEachern, M. T. *Hospital Organization and Management.* Chicago: Physicians' Record Company, 1946.

48. American Medical Association, Council on Medical Education and Hospitals. Essentials of a Registered Hospital. *J.A.M.A.*, Chicago, 112, 21:2166–2168 (May 27), 1939.

49. Murray, D. S., and McNee, L. C. J. *Now for Health.* London: St. Botolph Publishing Company, Ltd., 1946.

50. Socialist Medical Association. *S.M.A. Bulletin 87, Report of the S.M.A. Sub-Committee on Health Centres.* London, 1947.

51. Kark, S. L., and Kark, E. The Practice of Social Medicine. *J. Cape Town Post-Graduate Medical Association, Clinical Proceedings,* Cape Town, 4, 5 (July), 1945.

52. Gale, G. W. Health Centre Practice, Promotive Health Services and the Development of the Health Centres Scheme. *South African M. J.*, Cape Town, June 22, 1946, pp. 326–330.

53. Parry, R. H. Health Centres. *J. Roy. San. Inst.*, London, LXVII, 2:111–118 (Mar.), 1947.

54. The Society of Medical Officers of Health. Health Centres. *Pub. Health,* London, LXI, 1:5–12 (Oct.), 1947.

55. Health Centres of Tomorrow, Parts I–VI. *The Lancet,* London, CCLII (6436–6441):32–33, 78–79, 114–16, 154–55, 189–90, 228–30 (Jan. 4–Feb. 8), 1947.

56. American Medical Association. Health Centers Under the Hospital Construction Act. *J.A.M.A.*, Chicago, 134, 14:1179–1181 (Aug. 2), 1947.

57. Newsholme, A. *International Studies,* Vol. 3, England and Wales, Scotland, Ireland. London: George Allen & Unwin, Ltd., 1931.

58. Australia, Tasmania, Department of Public Health. *Report of the Secretary for Public Health, Tasmania, for 1945.* Hobart, 1946. Also personal communications.

59. Hunt, G. H., and Goldstein, M. S. Medical Group Practice in the United States, Part I, Introduction. *New England J. Med.*, Boston, 237, 3:71–77 (July 17), 1947.

Hunt, G. H., and Goldstein, M. S. Medical Group Practice in the United States, Part II, Survey of Five Groups in New England and the Middle Atlantic States. *New England J. Med.*, Boston, 237, 20:719–731 (Nov. 13), 1947.

Hunt, G. H., and Goldstein, M. S. Medical Group Practice in the United States, Part III, Report of a Questionnaire Survey of All Listed Groups, 1946. *J.A.M.A.*, Chicago, 135, 14:904–909 (Dec. 6), 1947.

60. Lee, R. I., and Jones, L. W. *The Fundamentals of Good Medical Care.* Washington: Committee on the Cost of Medical Care, 1933.

61. Bradbury, S. *Cost of Adequate Medical Care.* Chicago: University of Chicago Press, 1937.

62. International Labour Office. Social Insurance and Assistance. *Internat. Labour Rev.*, Montreal, LIII, 3–4:271, table (Mar.-Apr.), 1946.

63. Roemer, M. I. A Program of Preventive Medicine for the Individual. *Milbank Mem. Fund Quart.*, New York, XXIII, 3:209–226 (July), 1945.

64. United Nations, World Health Organization, Interim Commission. *Proposed Statistical Classification of Diseases, Injuries and Causes of Death.* Ottawa, 1947.

65. American Hospital Association. *Measuring the Community for a Hospital.* Chicago, 1945.

66. Corwin, E. H. L. *The American Hospital.* New York: The Commonwealth Fund, 1946.

67. Davis, G. Wanted: 381 Pathologists, 819 Radiologists. *Hospitals,* Chicago, 21, 10:49–51 (Oct.), 1947.

68. Hurlin, R. G. *Statistics of Medical Social Casework in New York City: 1945.* New York: Russell Sage Foundation, 1946.

69. U. S. Public Health Service, Division of Hospital Facilities, personal communication, V. M. Hoge, July 12, 1946.

70. American Hospital Association and National League of Nursing Education. *Manual of the Essentials of Good Hospital Nursing Service.* Chicago: American Hospital Assn., 1942.

71. Murray, D. S. *Health for All.* London: Victor Gollancz, Ltd., 1942.

72. Emerson, Haven. *Local Health Units for the Nation.* New York: The Commonwealth Fund, 1945.

73. General Medical Council. *Recommendations as to the Medical Curriculum.* London, 1947.

74. Ministry of Health, Department of Health for Scotland, Ministry of Labour and National Service. *Report of the Working Committee on the Recruitment and Training of Nurses.* London: H. M. Stationery Office, 1947.

75. American Medical Association, Council on Medical Education and Hospitals. *Essentials of an Acceptable Medical School.* Chicago, 1945.

76. American Medical Association, Council on Medical Education and Hospitals. Essentials of an Approved Graduate Medical School. *J.A.M.A.*, Chicago, 115, 9:725 (Aug. 31), 1940.

77. American Medical Association, Council on Medical Education and Hospitals. Essentials of an Approved Internship. *J.A.M.A.*, Chicago, 118, 17:1497–1500 (Apr. 25), 1942.

78. American Medical Association, Council on Medical Education and Hospitals. *Essentials of Approved Residencies and Fellowships.* Chicago, 1947.

79. American Medical Association, Council on Medical Education and Hospitals. Basic Science Instruction in Hospital Residencies. *J.A.M.A.*, Chicago, 133, 10:697–98, 717 (Mar. 8), 1947.

80. American Medical Association, Council on Medical Education and Hospitals. *Essentials for Approved Examining Boards in Specialties.* Chicago, 1942.

81. American Dental Association. *Reports of Officers and Committees, 88th Annual Session.* Chicago, 1947.

82. American Dental Association. Report of the Council on Dental Education. *J. Am. Dent. A.*, Chicago, 33:508 (Apr. 1), 1946.

83. American Dental Association. Report of the Council on Dental Education. *J. Am. Dent. A.*, Chicago, 33:915 (July 1), 1946.

84. American Dental Association. Report of the Council on Dental Education. *J. Am. Dent. A.* Chicago, 34:527 (Apr. 15), 1947.

85. American Council on Pharmaceutical Education. *Standards for Accreditation of Colleges of Pharmacy,* Baltimore, 1945.

86. National League of Nursing Education. *Statement of Policy for the Accreditation of Schools of Nursing.* New York, 1946.

87. American Hospital Association and American College of Hospital Administrators, Joint Commission on Education. *The Administrative Internship in the Hospital.* Chicago, 1947.

88. Office of Education. *Practical Nursing, Misc. No. 8.* Washington: Government Printing Office, 1947.

89. National Association for Practical Nurse Education. *Practical Nurse Education.* New York, 1947.

90. Deming, D. *The Practical Nurse.* New York: The Commonwealth Fund, 1947.

91. American Association of Medical Social Workers. *Statement of Standards.* Washington, 1947.

92. American Association of Psychiatric Social Workers. *Membership in the American Association of Psychiatric Social Workers.* New York, 1946.

93. American Dietetic Association. *Academic Requirements for Active Membership in the American Dietetic Association and Entrance to Courses for Student Dietitians Approved by the Executive Board.* Chicago, 1944.

94. American Medical Association, Council on Medical Education and Hospitals. *Essentials of an Acceptable School of Occupational Therapy.* Chicago, 1943.

95. American Medical Association, Council on Medical Education and Hospitals. *Essentials of an Acceptable School for Physical Therapy Technicians.* Chicago, 1943.

96. American Medical Association, Council on Medical Education and Hospitals. *Essentials of an Acceptable School for Medical Record Librarians.* Chicago, 1945.

97. American Medical Association, Council on Medical Education and Hospitals. *Essentials of an Acceptable School for Clinical Laboratory Technicians.* Chicago, 1943.

98. American Medical Association, Council on Medical Education and Hospitals. *Essentials of an Acceptable School for X-Ray Technicians.* Chicago, 1946.

99. American Public Health Association, Committee on Professional Education. *Report on the Educational Qualifications of Health Officers,* 1946.

100. American Public Health Association, Committee on Professional Education. *Report on the Educational Qualifications of Medical Administrators of Specialized Health Activities,* 1944.

101. American Public Health Association, Committee on Professional Education. *Report on the Educational Qualifications of School Physicians,* 1944.

102. American Public Health Association, Committee on Professional Education. *Report on the Educational Qualifications of Public Health Dentists,* 1945.

103. American Public Health Association, Committee on Professional Education. *Educational Qualifications of Industrial Hygienists,* 1941.

104. American Public Health Association, Committee on Professional Education. *Recommended Qualifications for Public Health Nursing Personnel,* 1942.

105. American Public Health Association, Committee on Professional Education. *Report on the Educational Qualifications of Health Educators,* 1943.

106. American Public Health Association, Committee on Professional Education. *Report on the Educational and Experience Qualifications of Public Health Laboratory Workers,* 1943.

107. American Public Health Association, Committee on Professional Education. *Educational Qualifications of Public Health Statisticians,* 1938.

108. American Public Health Association, Committee on Professional Education. *Report on the Educational Qualifications of Nutritionists in Health Agencies,* 1946.

109. American Public Health Association, Committee on Professional Education. *Report on the Educational Qualifications of Public Health Engineers,* 1947.

The April issue will be the Annual Special Book Issue. Dr. Huntington Williams, Health Commissioner of Baltimore, contributes an article entitled "The Health Officer's Book Shelf." There will be more book reviews than ordinarily and many announcements from publishers of newer books for public health workers.

Watch for the April Book Issue.

Experience of Rheumatic Patients Who Served in the Armed Forces, 1942-1946*

MAY G. WILSON, M.D., J. W. PAYSON, AND ROSE LUBSCHEZ

New York Hospital and the Department of Pediatrics, Cornell University Medical College, New York, N. Y.

WHEN war was declared in 1941, the patients under continuous medical supervision in the New York Hospital Children's Cardiac Clinic sought our advice as to eligibility for service. The majority of the 268 rheumatic patients of military age were eager to enter the services. It was our practice to offer a summary of the clinic record to each patient. Of the men who volunteered or were drafted, 62 per cent (167) were accepted. Most of these men denied their past history and made every effort to pass the physical examination. The majority of the 101 patients who were classified as 4F presented their past record at the induction center.

In Table 1, A and B, there is summarized the past rheumatic history and cardiac diagnosis for 242 men. It will be noted that all of these men had rheu-

TABLE I

RHEUMATIC HISTORY AND CARDIAC DIAGNOSIS

TYPE OF RHEUMATIC FEVER DURING CHILDHOOD (ONE OR MORE ATTACKS)	NO. MEN	VALVULAR DISEASE						CARDIAC ENLARGEMENT***			RECURRENT ATTACKS 1942-1946		
		M. I.		M. S.		A. I.		SLIGHT	MODERATE	MARKED	R. F.	B. E.	A. F.
A. SERVICE MEN													
ACTIVE CARDITIS AND CARDIAC FAILURE	32	18	14*	8	11*	4	3*	2	21	9	2	-	-
POLYARTHRITIS	34	16	18*	3	5*	-	-	9	22	3	1	-	-
CHOREA	33	13	20*	1	10*	-	-	11	21	1	-	-	-
POLYARTHRITIS & CHOREA	17	9	8*	2	5*	-	-	4	13	-	-	-	-
JOINT PAINS	25	14	11*	1	4*	1	-	9	15	1	-	-	-
TOTAL	141	70	71*	15	35*	5	3*	35	92	14	3	-	-
B. CIVILIAN GROUP													
ACTIVE CARDITIS AND CARDIAC FAILURE	43	34	9*	30	8*	22	1*	-	13	30	4*	1	2
POLYARTHRITIS	16	8	8*	2	8*	-	-	1	15	-	-	-	-
CHOREA	31	12	17*	4	10*	1	1*	3	26	2	-	-	-
POLYARTHRITIS & CHOREA	7	4	3*	4	3*	3	-	-	4	3	-	-	-
JOINT PAINS	4	2	2*	-	4*	-	-	1	3	-	3	1	1
TOTAL	101	60	39*	40	33*	26	2*	5	61	35	7	2	3

R.F.-RHEUMATIC FEVER
B.E.-BACTERIAL ENDOCARDITIS
A.F. AURICULAR FIBRILLATION

*REGRESSION OF MURMURS OF VALVULAR LESIONS
**INCLUDES ONE DEATH
***FLUOROSCOPIC EXAMINATION IN P.A. AND OBLIQUE VIEWS

* This study was aided by a grant from The Commonwealth Fund.

Presented on June 7, 1947, American Rheumatism Association Meeting.

matic fever and rheumatic heart disease. In the service group 23 per cent had one or more attacks of active carditis with failure. In about one-half of the service group and one-third of the civilian group, the physical signs of valvular lesions had regressed. As might be expected, in the civilian group the past rheumatic history was more severe and the resultant cardiac damage was of greatest degree. In this group 43 per cent had one or more attacks of active carditis with failure during childhood.

A continuous close contact was maintained with the men in service by frequent personal letters. In addition, home visits were made for exchange of information. The majority of the patients returned for clinic visits during furloughs and after discharge from the service. The civilian group remained under routine medical supervision.

The distribution of the men in the various branches of the armed forces and at primary and secondary training camps in the United States is summarized in Table 2 and in Figure 1.

TABLE 2

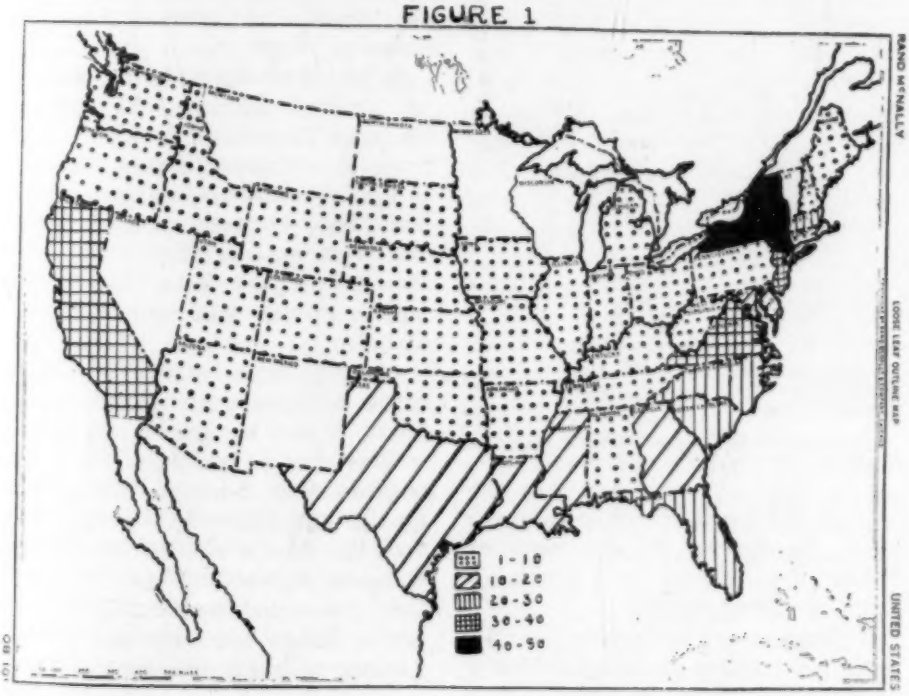
Distribution of 141 Men in Various Branches of Service *

Branch of Service	*Number*
Navy	49
Coast Guard, Merchant Marine	10
Marine Corps	12
Army	
AAF	26
Signal Corps, Engineers, Chem. Warfare, Communications	15
Infantry, Tank, Tank destroyers, Anti Tank	26
Ordnance, Anti Air, Coast and Field Artillery	12
Quartermaster, Cook, Clerk, Medical Corps	11
Amphibious Forces, Paratroopers, OSS	3
Not specified	4

* Individuals may be represented in more than one branch of service.

It is apparent that the majority of the men were under considerable physical stress and experienced various climatic exposures. Seventy-eight per cent were

FIGURE 1



sent overseas and 47 per cent were in active combat. In Table 3 distribution

TABLE 3

Distribution of 141 Men in Various Theaters of Operation *

Theater	*Number*
E.T.O.	44
Middle East	16
Pacific	61
North Atlantic	11
C.B.I.	11
Others	
Alaska, Aleutians, Iceland	4
Caribbean, South America	17

* Individuals may be represented in more than one theater.

of the men in various theaters of operation is presented.

During 386 patient-years of service, the morbidity experience in the United States and overseas is summarized in Table 4. Here it may be seen that, except for the low incidence of rheumatic fever, the various illnesses were not significantly different from Army and Navy morbidity reports.

TABLE 4

Morbidity Distribution of Service Group

Type of Illness	*Number*
Febrile	
Rheumatic Fever	3
Scarlet Fever	2
Measles	2
Meningitis	1
Pneumonia	5
Grippe, "Cat Fever"	9
Upper Respiratory Infections	24
Bronchitis, Sore Throat, Sinusitis	14
Infectious Mononucleosis	1
Tropical Diseases	17
Miscellaneous	
Asthma	2
Accidents, Sun Stroke	12
"Nervous," Battle Fatigue	16
Surgical, Skin Infections	21
Kidney Infections	2
Hypertension	2
Chronic Arthritis	1
Vague joint pains *	12
Battle Casualties	
Wounded	10
Deaths	2

* Complaints of fleeting pains with no constitutional symptoms. Not reported to medical officer.

A comparison of the incidence of rheumatic fever among our patients in service and at home revealed that 3 men were hospitalized for rheumatic fever while in the armed forces. In the civilian group during 402 patient-years, there were 7 patients with recurrent attacks, of whom 1 died. In addition, 2 patients had bacterial endocarditis and 2 developed auricular fibrillation. It is noteworthy that cardiac failure, bacterial endocarditis, and auricular fibrillation did not occur among the men in the service. Of particular importance is the observation that among the men who returned to the clinic since discharge, no change in physical signs or cardiac enlargement was observed. Two of the patients who developed rheumatic fever in 1945 are still in military hospitals. The third patient returned to the clinic for examination. No evidence was obtained to indicate further cardiac damage.

The high incidence of rheumatic fever (about 40,000 cases) among Army and Navy personnel would appear to indicate that the circumstances of military service impose a greater risk than civilian pursuits for recurrent attacks of rheumatic fever.

It has been reported that about 50 per cent of the men who developed rheumatic fever in the armed forces had a previous rheumatic history. According to Provision MR 1-9, a history of rheumatic fever without a recurrence within two years was not disqualifying. It is therefore probable that a relatively large number of rheumatic subjects were inducted.

Although the actual number of rheumatic subjects inducted into the armed forces is not known, an approximate number may be estimated. Using data obtained from Selective Service Headquarters, the Office of the Surgeon General, the Bureau of Medicine and Surgery, and the National Research Council, the number of rheumatic subjects in the armed forces was estimated and the number of rheumatic recurrences ex-

TABLE 5

Estimated Rheumatic Persons in the Armed Forces with Cases Expected and Observed

Source	Selective Service Hq.[5]	National Research Council (Beebe)[6]	Office of Surgeon General (Sartwell)[7]	Bureau of Medicine & Surgery (Ware)[8]
Years included	1940–1945	1942–1945	1942–1945	1942–1945
Total strength (Man-Years)	17,384,700 *	34,300,000	24,668,000	9,966,171
Rejectees:				
All defects	30%	—	—	—
Cardiovascular	5.7%	—	—	—
Rheumatic heart disease †	2.8%	—	—	—
Total population represented	17,384,700	48,999,985 ‡	35,239,989 ‡	14,237,383 ‡
No. rheumatic based on population incidence of 2%	—	980,000	704,800	284,748
3%	—	1,470,000	1,057,200	427,121
4%	—	1,960,000	1,409,600	569,495
No. rheumatic in service	815,789 **			
2%		607,600	436,976	176,544
3%		911,400	655,464	264,815
4%		1,215,200	873,952	353,087
Recurrences expected §	32,631			
2%		24,304	17,479	7,061
3%		36,456	26,218	10,592
4%		48,608	34,958	14,123
Cases observed	40,000	39,099	19,805	21,211

* Selective Service figures given for men, not man-years.

† Average experience reported in various services.

‡ Based on the assumption that the number of man-years in service is 70% of total man-years available for induction. (Value from Selective Service.)

** 17,384,700 x 2.8% = 499,810 rejected for rheumatic heart disease; based on cardiac clinic figures 499,810 = 38% of rheumatics available for induction. 62% of available rheumatic subjects were inducted.

§ Based on a civilian recurrence rate of 4%.[4]

pected in this group was calculated.

In making these analyses, it must be emphasized that the data released to us were not final reports, and that it was necessary to make certain assumptions which may not be entirely justified.

For these analyses, the following assumptions were made:

1. That the number of rheumatic subjects accepted and rejected by the armed forces was consistent with our clinic experience; i.e., 62 per cent were accepted and 38 per cent rejected.

2. That the incidence of rheumatic individuals in the population available for induction could be estimated as either 2 per cent, 3 per cent, or 4 per cent.

3. That the average civilian recurrence rate of 4 per cent, which was obtained in New York City for major recurrent attacks in this age group, is applicable to the men in service.

Analysis of Selective Service Data: About 17 million men were examined, of whom 30 per cent were rejected for all defects; 5.7 per cent were rejected for cardiovascular defects. Reëxamination of about 4,000 men revealed that on an average, 50 per cent of the cardiovascular rejectees had rheumatic heart disease. That is, about 500,000 men with rheumatic heart disease were rejected. If the proportion of rejectees and inductees from our cardiac clinic is representative, about 800,000 rheumatic subjects may have been inducted. In New York City we would expect about 33,000 recurrent attacks for this age group. About 40,000 cases of rheumatic fever have been reported for the men in the armed services.

Analysis of the Army and Navy Data: The total man-years in the services from 1942 to 1945 represent 70 per cent of the man-years in the population which was available for induction (30 per cent were rejected). Therefore the pool from which the service group was drawn represents 49 million man-years.

The incidence of rheumatic subjects available was calculated as 2 per cent, 3 per cent, and 4 per cent of this pool. The mean value, i.e., 3 per cent, receives support from the incidence of rheumatic heart disease rejectees reported by selective service. On the assumption that 62 per cent of these subjects were inducted, an estimated pool of 600,000 to 1 million rheumatic man-years in the service is obtained, of whom 4 per cent would be expected to have a recurrence.

The total number of recurrent attacks ranged from 24,000 to 48,000, depending upon the estimated population incidence. Thirty-nine thousand cases were reported by the National Research Council for the Army and Navy.

The closest agreement between expected recurrences and reported cases was obtained when the population incidence was assumed to be 3 per cent.

Comparable analyses were made for the Army data alone and the Navy data alone. These revealed that the predicted recurrences were greater than the observed cases in the Army, assuming a 3 per cent population frequency for the disease, although the agreement on the basis of a 2 per cent incidence was good. For the Navy data, it is apparent that the number of expected recurrences was underestimated, regardless of the population frequency assumed.

SUMMARY AND CONCLUSIONS

1. Two-thirds of the rheumatic patients of draft age in the Cardiac Clinic were accepted in the armed forces.

2. The incidence of rheumatic fever (major recurrent attack) among 141 rheumatic patients in the armed forces was less than 2 per cent for 386 patient years.

3. The incidence of recurrence among 101 rheumatic patients rejected for service was 7 per cent for 400 patient-years.

4. Men with rheumatic heart disease were able to tolerate strenuous activity in basic training and under combat conditions.

5. If the assumptions made are valid and within the limitations of the data available for analysis, it appears that the majority of the attacks of rheumatic fever reported in the services were recurrences.

6. Our own limited cardiac clinic experience indicates that the risk for a recurrent attack of rheumatic fever is no greater in the services than in civilian pursuits.

REFERENCES

1. Massell, B. F., and Jones, T. D. Some Practical Aspects of the Rheumatic Fever Problem Which Have an Important Bearing in Military Medicine. *Am. Heart J.* 27:575–587 (Apr.), 1944.

2. Silver, Captain Saul L., and Baker, Lt. Colonel Lyle A. Re-examination of Veterans Discharged Because of Heart Disease or Hypertension. *J.A.M.A.* 130:136–139 (Jan. 19), 1946.

3. Parran, Dr. Thomas. "Heart Disease," Radio Talk, Feb. 10, 1947. Mutual Broadcasting System, 1:30 P.M. E.S.T.

4. Wilson, May G., and Lubschez, Rose. Recurrence Rates in Rheumatic Fever. *J.A.M.A.* 126:477–480 (Oct. 21), 1944.

5. Selective Service Headquarters. Aug. 1945, *Report.*

6. National Research Council. Beebe, Gilbert W., Personal Communication.

7. Office of the Surgeon General. Sartwell, Philip E., Personal Communication.

8. Bureau of Medicine & Surgery. Ware, Captain Robert L., Personal Communication.

Salmonella from Dogs and the Possible Relationship to Salmonellosis in Man*

ARTHUR H. WOLFF, D.V.M.,† NORMAN D. HENDERSON, B.S., AND GRACE L. McCALLUM, B.S.

Bureau of Disease Control and Bureau of Laboratories, Michigan Department of Health, Lansing, Mich.

RELATIVELY little information is available concerning the occurrence of Salmonella in dogs. Bruner and Edwards[1] have identified four Salmonella types from 18 outbreaks among dogs, namely: *S. typhimurium, S. cholerasuis, S. anatum* and *S. newport*. Edwards[2] maintains that these dogs were almost invariably affected with enteritis and in some cases whole litters of pups died of enteritis and septicemia. Van Dorssen[3] describes enteritis in puppies experimentally produced by feeding *S. enteritidis var. dublin*. Stafseth[4] reports a septicemic outbreak caused by *S. choleraesuis* in a litter of pups. *S. bredeney* and *S. newington* have also been reported from canine septicemia by Dolman[5] and Castelo,[6] respectively. Seligmann[7] alludes to the isolations of *S. anatum* and *S. panama* from dogs. Reitler[8] describes a peculiar disease observed in Palestine among dogs living in groups. The disease appeared to be associated with tick infestation. It either produced a fatal septicemia or ran a chronic course with rash, cough, anemia, and neuritic symptoms. From these outbreaks a new Salmonella type possessing the antigenic formula VI, XIV, XXIV . . . r-1.7. was isolated. Shirlaw[9] discusses *S. typhimurium* infection of dogs in India. Newman[10] isolated *S. give* from a dog affected with diarrhea of over a month's duration.

Of public health interest are several Scandinavian reports in which outbreaks of human Salmonella infection were shown to be epidemiologically related to Salmonella infections among dogs. Kauffmann[11] reports an outbreak of gastroenteritis involving six members of a family of seven and the family dog. *S. glostrup* was isolated from the feces of all members of the family and from the blood of the infected dog. Although the origin of infection was not determined, it was assumed that the sources of infection for man and dog were identical. Caspersen[12] reports a case in which an infected dog was the source of a paratyphoid outbreak involving six human beings. *S. paratyphi B* was the causal organism isolated from the human cases. The diseased dog was incriminated as the source on the basis of the clinical history and analytical serological tests. Another instance in which the dog was considered the source of a human paratyphoid outbreak is described by Magnusson.[13] The causative organism, isolated from the involved dog and human beings was *S. abortus-canis*.[14]

Because of the possible public health significance of canine salmonellosis a study was initiated by this department to determine to what extent dogs may

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.

† Division of Veterinary Public Health, U. S. Public Health Service.

serve as hosts for the Salmonella group and to determine the clinical manifestations these organisms may produce in dogs.

The dogs examined in this study were from three sources: the Michigan State College Veterinary Clinic, Lansing Animal Shelter, and a private kennel. This paper gives the preliminary results from bacteriological examination of 100 dogs. Eighteen of these animals were found to be excreting 16 different Salmonella types.

METHODS

In the present study, fecal specimens were collected by means of a rectal swab technique adapted from that described for human beings by Hardy.[14] One hundred and sixty-eight fecal specimens were collected from 100 dogs. The swabs were dropped directly into tetrathionate broth and incubated for 18–24 hours at 37°C. Following incubation, 0.1 ml. was streaked upon SS agar. The glass rod used for streaking was carried over to the second SS plate to obtain a less heavily seeded plate. Poured bismuth sulfite plates with 0.1 ml. of inoculum were also used. However, these appeared to offer no additional advantages and were discontinued. The SS plates were incubated for 24 hours at 37°C. Non-lactose-fermenting colonies were inoculated into Hajna's triple sugar slants. Proteus organisms were eliminated on the basis of urease activity, using the medium of Rustigian and Stuart.[15] Growth from triple sugar slants showing Salmonella-like * reactions was tested with polyvalent Salmonella serum. Those cultures agglutinated by the serum were sent to the Salmonella Typing Station † where identification was made on the basis of biochemical reactions and antigenic analysis.

* Acid and gas in the butt, alkaline slant with or without H_2S

† Michigan Department of Health, Bureau of Laboratories

RESULTS

Table 1 summarizes the data on rectal swabs collected and cultured from 74 dogs at the Michigan State College Veterinary Clinic and the Lansing Animal Shelter. Repeat specimens from these dogs were usually unavailable. The animals are grouped in Table 1 according to their clinical conditions. Five of the 38 "Distemper" dogs yielded Salmonella organisms: *S. typhimurium* was isolated from two of these dogs, and *S. newport*, *S. manhattan* and *S. minnesota* (monophasic) were each isolated once from distemper cases. All of these cases exhibited enteritis of varying degrees. The eight dogs grouped under "Gastroenteritis" were animals with a primary condition of gastroenteritis and no known history of any predisposing or incitatory factors. The one positive dog from which *S. oranienburg* was isolated appeared normal at the time of collecting the specimen but 24–36 hours later exhibited a severe diarrhea persisting for 2 days. A repeat specimen 10 days later was negative. Included in the "Normal" group were "boarders" and "strays," all appearing clinically well, at the Veterinary Clinic and Animal Shelter. No Salmonella were isolated from these normal dogs.

The monophasic variety of *S. minnesota* in Table 1 was recovered from a dog with a 3 months' history of intermittent fever and diarrhea. The animal had never fully recovered from what had originally been diagnosed as distemper. This particular case led to the investigation of the private kennel from which this dog originated. The word "kennel," in this instance is perhaps a misnomer. It was found that 25 to 30 dogs were housed with three human beings in a small three room dwelling. As might be conjectured, disease was rampant among the dogs. Distemper, enteritis, and septicemia were continually decimating the animal population of the household.

A total of 94 fecal specimens, taken

TABLE 1

Salmonella Types Isolated from Dogs at Michigan State College Veterinary Clinic and the Lansing Animal Shelter

Clinical Conditions	*Number of Dogs Examined*	*Number of Isolations*	*Types of Salmonella Isolated*
Distemper	38	5	*S. typhimurium, S. manhattan S. newport, S. minnesota* (monophasic)
Gastroenteritis	8	1	*S. oranienburg*
Normal	28	0	.....

in four series at 10–12 day intervals, were collected from 27 of these dogs. After an interim of one month a fifth series was collected. All the dogs were not always available for reëxamination. However, 3 to 5 fecal specimens were obtained from most of the animals.

Table 2 presents the data on 13 animals in the "kennel" from which Salmonella were recovered. Stool specimens from the remaining dogs were negative for Salmonella.

strated from one of the six animals. Four dogs yielded *S. bredeney* which was not recovered from any repeat specimens. *S. cubana* was identified from two dogs and once on repeat examination. The following were all isolated on single occasions: *S. minnesota* (monophasic) *S. minnesota* (diphasic), *S. worthington, S. give, S. cerro, S. kentucky, S. illinois, S. meleagridis* and two monophasic types with the antigenic formulae XXVIII:y and III,XV:z_{10}. The latter two

TABLE 2

Salmonella Types Isolated from a Private Kennel

	Date of Specimen Collection				
Dog	*I—Feb. 6, 1947*	*II—Feb. 13, 1947*	*III—Feb. 27, 1947*	*IV—March 11, 1947*	*V—April 14, 1947*
A.	*S. minnesota* * (monophasic)	(died) x	x	x	x
B.	*S. bredeney*	negative (died)	Autopsy negative for Salmonella	x	x
C.	*S. oranienburg*	negative	*S. kentucky*	negative	negative
D.	*S. oranienburg*	negative	*S. oranienburg*	x	x
E.	*S. bredeney*	*S. give*	negative	negative	negative
F.	*S. bredeney*	negative	*S. cubana* *S. oranienburg* *S. cerro*	negative	negative
				S. cubana † *S. meleagridis* †	
G.	*S. minnesota*	negative	*S. oranienburg*	*S. illinois*	x
H.	*S. bredeney*	negative	negative	negative	negative
I.	negative	negative	*S. cubana*	negative	negative
J.	*III, XV:z_{10}*	negative	negative	negative	negative
K.	negative	*S. oranienburg*	negative	negative	negative
L.	*S. worthington XXVIII:y*	negative	negative	negative	negative
M.	*S. oranienburg*	x	x	x	x

* Fecal specimen collected at Veterinary Clinic 10 days prior to indicated date
† Fecal specimens from which these organisms were isolated were collected between dates of series IV and V
x = No specimen collected

As can be observed in Table 2 the most frequently isolated type from the kennel was *S. oranienburg*. This organism was recovered from six dogs. Repeat isolation of this type was only demonorganisms have not yet been officially named. They appear to be monophasic varieties of *S. tel-aviv* and *S. illinois*, respectively.

The bacteriological findings recorded

in Table 2 present an incongruous picture. Not only were repeat isolations relatively few but in several instances (Dogs C, E, F, and G), subsequent examinations resulted in the finding of one or more Salmonella differing in type from the preceding isolations. In addition, more than one Salmonella type was recognized in single stool specimens of dogs L and F.

The pathological significance of these Salmonella organisms for this kennel is obscure. The kennel owner claims that almost the entire kennel was affected with septicemia, distemper, or enteritis at one time or another during the 6 months prior to our investigation. Fecal specimens taken from two of the kennel members during sieges of diarrhea were negative for Salmonella. Post-mortem bacteriological examinations of two 6 week old puppies affected with hemor-

TABLE 3

Previously Reported Isolations of the Salmonella Types Found in this Study

	Dogs	*Man*		
Salmonella Type	***Clinical Condition***	***Clinical Condition***	***Fowl and Animals (other than dogs)***	***Other Occurrences***
S. bredeney	Septicemia [5]	Infant-diarrhea,[17] gastroenteritis,[18] septicemia * [17]	Fowl,[19] swine, cattle and sheep [1]	Porcine lymph-nodes,† [20, 21] retail pork,[22] dried egg powder [23]
S. cerro	.....	Infant-diarrhea,[17]	Fowl [19]	Porcine lymph-nodes,† [24] dried egg powder [23]
S. cubana	.....	Gastroenteritis [2]	Fowl [25]	.....
S. give	Gastroenteritis [10]	Infant-diarrhea,[17] gastroenteritis,[19, 26] septicemia,* [26] and carriers [17, 26]	Fowl [19] and swine [1]	Porcine lymph-nodes,† [20] retail pork,[22] dried egg powder [23]
S. illinois	.....	Gastroenteritis [2]	Fowl and swine [19]	.....
S. kentucky	.....	Gastroenteritis,[17, 26] and septicemia * [27]	Fowl,[19] camels, and reptiles [1]	Food poisoning,[23] dried egg powder [23]
S. manhattan	.....	Gastroenteritis and carriers [19, 26]	Fowl,[19] swine, and reptiles [1]	Dried egg powder [23]
S. meleagridis	.....	Infant-diarrhea,[17] gastroenteritis, septicemia,* and carriers [19, 26]	Fowl,[19] swine, and reptiles [1]	Porcine lymph-nodes,† [20] dried egg powder,[23] food poisoning,[23] and sewage [20]
S. minnesota	.....	Infant-diarrhea,[17] gastroenteritis [7]	Fowl,[19] cattle, and swine [1]	Dried egg powder [23]
S. minnesota (monophasic)	.....	Gastroenteritis and septicemia * [21]	.....	.....
S. newport	Enteritis and/or septicemia [1, 3]	Infant-diarrhea,[17] gastroenteritis, septicemia,* and carriers [19, 26, 27]	Fowl,[19] cattle, swine, rodents, mink, foxes, and reptiles [1]	Porcine lymph-nodes,† [21, 24] dried egg powder, and food poisoning [23]
S. oranienburg	.....	Infant-diarrhea,[17] septicemia,* and carriers [19, 26, 27]	Fowl,[19] and foxes [1]	Dried egg powder and food poisoning [23]
S. typhimurium	Enteritis and/or septicemia [1, 3]	Isolated from many clinical conditions, primarily gastro-enteritis	Many species of birds and animals	Numerous miscellaneous isolations
S. worthington	.....	Gastroenteritis, septicemia * and carriers [19, 27]	Fowl,[19] cattle, swine, and rodents [1]	Porcine lymph-nodes,† [20] dried egg powder, and food poisoning [23]
III,XV:z_{10}	.....	.....	Fowl [3]	.....
XXVIII:y.	.....	.....	Fowl [3]	.....

* Septicemia refers to any of the following clinical pictures: enteric (or paratyphoid) fevers; generalized septicemia and/or localized septic manifestation.

† Mesenteric lymph nodes of apparently healthy swine.

rhagic enteritis were negative for Salmonella.* Moreover, all of the dogs from which Salmonella were isolated, with the exception of A and B, were clinically normal at the time of our examinations. Both dogs A and B died of enteritis and septicemia, and postmortem bacteriology of dog B revealed no Salmonella. A blood specimen was obtained from dog F from whose feces five different Salmonella types were isolated. The culture of the blood was negative. Agglutination tests were performed with the serum against each of the five types recovered from this dog. The highest demonstrable titer was 1:40 with *S. bredeney*.

In view of the incongruity of the Salmonella isolations from this kennel and in view of the kennel's decidedly substandard sanitation, it was thought that the food or drink might be affording a means of "reinfection." No Salmonella could be isolated from the water. However, both the well and cistern gave a high coliform index. Water samples taken from the common watering bowl yielded only Proteus strains which might indicate fecal contamination. Of the food included in the ration, eggs seemed to be the most likely source. All eggs consumed by these dogs were rejected candled eggs from a local market. Eggs from the local market and the supply stored at the kennel have been cultured. To date, only *S. pullorum* has been isolated.

DISCUSSION

It is difficult to assess the pathological significance of these Salmonella types for dogs on the basis of this limited study. The combined data from the Michigan State College Veterinary Clinic and the Animal Shelter indicate some association of these organisms with distemper or enteritis, or both. On the other hand, the kennel findings suggest the possibility that these kennel dogs were transient carriers. In any event it appears that the dog may serve as a more frequent host of Salmonella than has been thought in the past.

Table 3 illustrates some previously reported occurrences of the Salmonella types identified in this study. The 16 types recognized in this work are serologically, biochemically, and morphologically similar to those frequently infecting man, birds, and other animals. Consequently an epidemiological relationship may exist between dogs, birds, man, and other animals. To the writers' knowledge, of the types found in this work, only *S. give*, *S. bredeney*, *S. newport*, and *S. typhimurium* previously have been reported from dogs. On the other hand, all of the 16 types have been isolated as suspected pathogens from human beings with the possible exceptions of those organisms with the antigenic formulae III,XV:z_{10}—and XXVIII:y.

SUMMARY

The following Salmonella types have been recovered from dogs by other workers: *S. typhimurium*, *S. choleraesuis*, *S. anatum*, *S. newport*, *S. panama*, *S. give*, *S. bredeney*, *S. newington*, *S. paratyphi B*, *S. abortus-canis*, *S. glostrup*, *S. enteritidis* yar. dublin and a type closely related to *S. carrau*. Most cases manifested enteritis with septicemia occurring as a frequent sequel.

A study has been started to collect data pertaining to the incidence and significance of Salmonella organisms among dogs. Stool specimens were collected by rectal swabs from 100 dogs. Tetrathionate broth and SS Agar were used routinely for isolation procedures. Salmonella types were recovered from the stools of 18 of the 100 dogs examined. The following types were identified: *S. manhattan*, *S. newport*, *S. minnesota* (both monophasic and diphasic varieties), *S. oranienburg*, *S.*

* The immediate cause of death in both pups was ileal intussusception.

typhimurium, S. bredeney, S. worthington, S. give, S. cubana, S. cerro, S. kentucky, S. illinois and *S. meleagridis*. There were two types isolated to which the antigenic formulae of XXVIII:y and III, XV:z_{10} respectively were ascribed.

The pathological significance of these isolations has not yet been entirely ascertained, and additional work is being performed toward this end. However, this work does indicate that the dog may be a frequent host for the Salmonella organisms. In view of the established pathogenicity for man of most of the above cited Salmonella organisms, the dog should be considered as a potential source of Salmonella infection for man.

ACKNOWLEDGMENT: The authors wish to express their appreciation to Dr. P. R. Edwards of the Salmonella Typing Station, University of Kentucky, Lexington, Ky., for his assistance in confirming some of the Salmonella types identified in this work.

REFERENCES

1. Bruner, D. W., and Edwards, P. R. Salmonellosis of Domestic Animals. *Proc. Fiftieth Annual Meeting of U. S. Livestock Sanitary Assoc.*, 1946.

2. Edwards, P. R., Bacteriologist, University of Kentucky (personal communication).

3. Van Dorssen, C. A. Experimental Infection of Puppies with *S. Enteritidis* var. Dublin. *Z. Veterinark.*, 49:419, 1937. (Abstract, *Vet. Bull.*, 9:146, 1939.)

4. Stafseth, H. J., Neu, L., and Sholl, L. B. *Salmonella cholerae-suis* Infection in Pups. *M.S.C. Vet.*, 5:21–22, 1944.

5. Dolman, C. E. Bacterial Food Poisoning. *Canad. Pub. Health J.*, 34:97–111, 1943.

6. Castelo, M., and Salsamendi, R. C. *Salmonella newington* in the Dog. *An. Fac. Vet.*, Montevideo, 4:359–361, 1938. (Abstract, *Vet. Bull.*, 11:355, 1941.)

7. Seligmann, E., Saphra, I., and Wassermann, M. Salmonella Infections in the U. S. A., *J. Immunol.*, 54:69–87, 1946.

8. Reitler, R., and Menzel, R. Some observations on Salmonella Strains in Dogs, Mice and Ticks. *Tr. Roy. Soc. Trop. Med. & Hyg.*, 39:523–527, 1946.

9. Shirlaw, J. F., McDonald, J., and Hayes, W. Canine Typhi-murium Infection. *Indian Vet. J.*, 22:87–89, 1946.

10. Newman, J. P., Department of Bacteriology, Michigan State College (personal communication).

11. Kauffmann, F., and Henningsen, E. D. A New Type of Salmonella from Man and Dog. *Acta. Path. et microbiol Scandinav*, 16:99–102, 1939. (Abstract, *Vet. Bull.*, 9:825, 1939.)

12. Caspersen, J. A Paratyphoid Outbreak with a Peculiar Origin (Dog). *Fork. Norsk. Med. Sels. K.*, 10:138–143, 1937. (Abstract, *Vet. Bull.*, 9:825, 1939.)

13. Magnusson, K. E. A Dog as a Source of Paratyphoid Infection. *Ztschr. Hyg. u. Infektionskr.*, 121:136–138, 1938. (Abstract, *Vet. Bull.*, 9:825, 1941.)

14. Gard, S. A New Type of Salmonella, *S. abortus-canis*. *Ibid.*, 432–434.

15. Hardy, A., Watt, J., and Decapito, T. Studies of the Acute Diarrheal Disease, VI. *Pub. Health Rep.*, 57:521–524, 1942.

16. Rustigian, R., and Stewart, C. A. Decomposition of Urea by Proteus. *Proc. Soc. Exper. Biol. & Med.*, 47:108, 1941.

17. Hormaeche, E., Surraco, J. L., Pellufo, C. A., and Aleppo, P. L. Causes of Infantile Summer Diarrhea, *Am. J. Dis. Child.*, 66:539–551, 1943.

18. Kauffmann, F. A New Salmonella Type (*Salmonella bredeney*) and Evaluation. *Ztschr. f. Hyg. u. Infectionskr.*, 119:356–368, 1937.

19. Edwards, P. R., and Bruner, D. W. Occurence and Distribution of Salmonella Types in the United States, *J. Infect. Dis.*, 72:58–67, 1943.

20. Rubin, H. L., Scherago, M., and Weaver, R. H. The Occurence of Salmonella in the Lymph Glands of Normal Hogs, *Am. J. Hyg.*, 36:43–47, 1942.

21. Hormaeche, E., and Salsamendi, R. Presence in Mesenteric Ganglia of Normal Hogs of Bacteria of Salmonella Group Which Cause Summer Diarrhea in Children. *Arch. Urug. Med., Ary. Espec.*, 9:665–672, 1936.

22. Cherry, W. B., Scherago, M., and Weaver, R. H. The Occurrence of Salmonella in Retail Meat Products, *Am. J. Hyg.*, 37:211–215, 1943.

23. Topley, W. W., and Wilson, G. S. *Principles of Bacteriology and Immunity*, Williams & Wilkins, 3rd ed., 1946.

24. Hormaeche, E., and Salsamendi, R. Normal Hog as Carrier of Salmonella, *Arch. Urug. de Med. Cir. y Espec.*, 14:375–387, 1939.

25. Seligmann, E., Wassermann, M., and Saphra, I. A. New Salmonella Type: *Salmonella cubana*. *J. Bact.*, 51:123–124, 1946.

26. Bruner, D. W., and Joyce, B. J. Salmonella Types Encountered by the 15th Medical General Laboratory, *Am. J. Hyg.*, 44:19–24, 1947.

27. Seligmann, E., Saphra, I. A., and Wassermann, M. Salmonella Infections in Man, *Am. J. Hyg.*, 38:226–249, 1943.

28. Solowey, M., et al., Microbiology of Spray-Dried Whole Egg, *A. J. P. H.*, 37:971–982, 1947.

29. Varela, G., and Zozaya, J. Salmonella from Hogs, *Rev. Inst. Salubr. Inferm. Trop.*, 2:311–318, 1941.

30. Bornstein, S., and Saphra, I. A. The Occurrence of Several Unusual Salmonella Species, *J. Infec. Dis.*, 71:55–56, 1942.

31. *Case Histories*, Michigan Department of Health, Bureau of Disease Control.

Problem of Dust Control for the Disinfection of Air*

FROM the standpoint of control, all air-borne diseases, with few exceptions, may be considered to take place "indoors" where people congregate, and the bacterial and viral content of the intramural environment attains an infective level. Whether pathogens in "droplet nuclei" as defined in the report of the Subcommittee for the Evaluation of Methods of Control of Air-borne Infections[1] are more important in the spread of air-borne diseases than dust-borne organisms from "environmental reservoirs" on floors, clothes, and bedding, has not been determined. Irrespective of the size of the droplets in which bacteria are expelled from the respiratory tract, the majority relatively soon settle and become components of dust.[2] Several studies, which have been published in the past year, have added much information concerning the relative importance of the methods of dispersal of respiratory disease agents in the air and the immediate environment. It seems important to summarize the results of these studies briefly.

Dispersal of respiratory disease agents into the environment: Duguid,[3] employing *Erythrobacillus prodigiosus* as the tracer organism, found that speaking, coughing, and sneezing produced many droplets small enough to remain air-borne as droplet nuclei, and that essentially all of these droplets originated from the front of the mouth. The extent of air-borne infection which may occur from droplet nuclei then must depend on the frequency with which pathogenic organisms occur in the secretions in the anterior mouth. Examining 85 scarlet fever, 50 faucial diphtheria, and 20 open tuberculosis patients, he found, respectively, small numbers of hemolytic streptococci, diphtheria bacilli, and tubercle bacilli in the anterior mouth secretions of only a small portion of the individuals in each group.[4]

Studying the size of droplets expelled by sneezing, coughing, and talking by microscopic measurement, Duguid[5] found that they ranged in diameter from 1 to 2,000 microns, the most common being between 4 and 8 μ. The proportion of droplets of each size which contained bacteria, whether commensal or pathogenic, was determined by the size of the droplets and by the number of bacteria in the secretions atomized. Calculations made on the basis of size distribution showed that few of the smaller droplets and, thus, fewer droplet nuclei are likely to contain organisms. He concluded, therefore, that droplet spray is unlikely to give rise directly to air-borne infection unless very large numbers of pathogenic organisms are present in the secretions of the anterior mouth. In undisturbed air of a 1,700 cu.ft. room, Duguid found that 90 per cent of the bacteria carrying droplet nuclei disappeared by settling in from 30 to 60 minutes; particles larger than 8 μ disappeared in 20 minutes, while smaller particles remained suspended for a longer period of time. When the air

* Referee's Report on Suppressive Measures for the Control of Dust, to the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents. Committee authorized 1941. Published Reports, *A.J.P.H.*, May, 1943, Aug., 1944, Aug., 1945, Apr., 1946, and Apr., 1947.

was disturbed by a fan, the bacteria disappeared at a much faster rate.

Hare and associate have extended their observation on the mechanism of spread of bacterial and certain virus infections of the respiratory tract.[6] They confirmed their earlier observations and those of Duguid[3-5] that the number of organisms expelled varies according to the type of respiratory activity, and concluded that only by "violent and impolite" methods (sneezing) can a carrier of a pathogen infect the atmosphere of his vicinity to any great extent directly from his mouth or nose. They point out that the path which organisms take after leaving the nose and mouth will likewise vary with the particular activity but will, in general, be downward and forward. The site of impingement of the great majority of particles is on objects below the level of the head, resulting in the direct contamination of the immediate environment of the donor by his nasal and buccal secretions. As these extruded bacteria can be raised again and again into the air as dried particles, Hare considers these dust-borne agents responsible for conveying infections to others.

The recent studies of Hamburger and coworkers[7-9] support the findings of Duguid[3-5] and Hare.[6] These investigators found that persons with positive nose cultures for hemolytic streptococci extruded many more of these pathogens into their environment than did those with positive throats alone. By far the greatest number were expelled by blowing the nose, although some individuals dispersed hundreds and millions of streptococci, respectively, by coughing and sneezing. In wards housing these individuals only an occasional hemolytic streptococcus could be recovered from the air during quiet periods; whereas, during periods of bedmaking and floor sweeping large numbers were recovered from the air.

From their studies, Hamburger and associates[9] concluded that the extensive streptococcal contamination of the environment took place somewhat as follows: The act of blowing the nose and sneezing contaminated the handkerchief and, simultaneously, the hands, with a few streptococci escaping into the air. From the handkerchief, the dried nasal secretions containing hemolytic streptococci are dispersed into the air and settle out as dust. The contaminated hands provide the opportunity for transfer of microörganisms to personal clothing, bedclothes, and anything with which they come in contact. Thus, by these routes the environmental surfaces and air may become markedly contaminated with pathogens; this would probably be the usual situation where streptococcal disease was epidemic in hospital wards, boarding schools, orphan asylums, and military barracks and schools. They further conclude that direct hits by streptococci expelled by unprotected sneezing, coughing, or talking, or the inhalation of droplet nuclei containing streptococci dispersed by these activities undoubtedly account for a certain number of sporadic infections, but they are probably of secondary importance in the epidemic spread of streptococcal disease.

Hodges and MacLeod recently reported an extensive study on epidemic pneumococcal pneumonia in an army camp.[10] The presence of specific pneumococcal types throughout the population was uniform and pneumonia occurred in all parts of the camp. Airborne dissemination of pneumococci among the personnel appeared to be a likely explanation of this epidemiological picture, for it was found on culturing the dust in the schoolrooms and barracks that a high percentage of the samples were positive for pneumococci. The types found in the dust reflected directly the prevailing types of pneumococci in the throats of carriers, supporting the earlier work of Stillman.[11]

Little is known concerning the mech-

anisms of the spread of virus diseases of the respiratory tract. In all probability they are air-borne, and because of their small size as compared to bacteria may well be carried in droplet nuclei. At the same time, they may be dispersed as dust-borne agents. Influenza virus A is known to be resistant to drying and will survive in the environment for several days.[12] Recent studies of laboratory outbreaks of Q fever strongly incriminate infected dust-borne particles as the means of dissemination.[13, 14]

While investigating the problem of air hygiene in dressing rooms for burns or major wounds with a new sampling device, Bourdillon and Colebrook[15] found that large numbers of bacteria were liberated when dry bandages and wool were removed from a patient. Likewise, large clouds of bacteria often containing pathogens were liberated by the movement of pajamas or other bedclothes that have been used for some hours. Their data confirm the observation of others that unoiled blankets should not be allowed in any surgical dressing room.

New apparatus for measuring particle size: There is a tremendous range in the size of droplets expelled in mouth and nose secretions during talking, sneezing, coughing, blowing the nose, and spitting, and the final size of droplet nuclei or dust-borne particles capable of carrying pathogens is not accurately defined.[16] Knowledge of the range of particle size of dust containing bacteria which are dispersed into the air during bedmaking and floor sweeping would be most helpful in evaluating the importance of dust-borne bacteria in the spread of respiratory disease. Hatch[17] reviews the problem of the behavior of microscopic particles in the air and in the respiratory system. Studies show that particles larger than 5 μ are removed primarily in the upper respiratory tract while progressively smaller particles are deposited in the more distal parts of the bronchial tree and alveoli.

These findings are supported in a recent study by Davis.[18] Employing the rabbit as the experimental animal, he found that droplets above 7 μ were all removed by the nose during inhalation. About half the 3 μ diameter drops penetrated the lungs and practically all those 1.5 μ and smaller.

Most instruments utilized in the collection of dust particles for size measurement employ a single jet or slit and a single stage for deposition of the dust. Recently a new instrument called " the Cascade Impactor," for sampling liquid and solid aerosols has been described by British workers.[19] Because this apparatus seems applicable to the study of the size range of naturally dispersed droplet nuclei and dust-borne particles carrying bacteria in a given atmosphere, a brief description of it is given. This instrument is suitable for sampling wind-borne and stationary aerosols such as natural fogs and clouds, fine sprays, insecticidal mists, coarse dusts, pollen, and spores, etc. By means of four progressively finer jets impinging on glass slides in series the sample is split up into size-graded fractions in a form suitable for microscopic analysis. The greatest efficiency of sampling is achieved for particles in the diameter of range 50 to 1.5 μ. The size-grading greatly facilitates the detailed microscopic examination of heterogeneous samples and in some cases enables approximate size-distributions to be obtained by bulk estimations of the samples without the need for microscopic sizing. A complete description with diagrams and photographs of the apparatus and results of sizing aerosols of certain liquid and solid materials is given.

Recently, Sonkin[20] has described a modified cascade impactor for sampling and sizing aerosols of particles below 1 μ in diameter. He was able to separate clouds containing particles of glycerol water, methylene blue solution

below 1 μ into different size classes permitting rapid and convenient size characterization of the aerosol. In discussing the question of the use of the cascade impactor with Sonkin, he states that it can be readily adapted to the study of size range of naturally dispersed bacterial particles (droplet nuclei and dust-borne particles).[21]

Landahl and Block,[22] studying the penetration of air-borne particles through the human nose have also employed the cascade impactor. Employing corn oil, sodium bicarbonate, and tricalcium phosphate, they studied the effect of particle size and flow rate through the nose. They found that (a) in the case of corn oil droplets passing through the nose at 10, 17, 29, and 60 liters per minute, the particle diameters corresponding to 50 per cent penetration were found to be 8, 5, 5, and 2 μ, respectively; (b) for sodium bicarbonate particles at 17 and 60 liters per minute, the diameters for 50 per cent penetration were 2 and 1 μ; and (c) for tricalcium phosphate at 17 liters, the 50 per cent penetration size was 4 μ.

Studies on the application of oil to floors and bedclothes for the control of dust-borne bacteria and cross-infections in hospitals: In an Australian hospital, Rountree and associate [24] found large numbers of hemolytic streptococci in the ward floor and blanket dust and also in the dust from the floor of the surgical dressing room where the sterile trays were prepared. Sampling the ward air revealed a marked increase in the number of bacteria during bedmaking.

Rountree [25] found that the emulsifying mixture referred to as "Fixanol C" [26] containing cetyl pyridinium bromide known to be highly germicidal exhibited marked bactericidal properties for a number of Gram-positive and Gram-negative organisms. Likewise, the "Fixanol C" when incorporated in the oil-in-water emulsion imparted a bactericidal action to the emulsion. Blankets treated with "Fixanol C" and oil became bactericidal and retained this property for as long as 3 months. Although she found a 1 per cent water solution of "Fixanol C" non-irritating to the skin as shown by the patch test, it was pointed out that the hypersensitivity of certain individuals to bromide drugs should be borne in mind when subjecting them to the wearing of garments or sleeping in blankets treated with this oil formula.[26] Wright and associates [30] in discussing their experience with this oiling method consider the risk of skin irritation negligible.

A trial study [27] over a 4 month period, employing blankets oiled with "Fixanol C" without other dust control measures, was made by Rountree. No effect was observed on the incidence of wound cross-infection on a surgical ward, although the treated blankets were shown to contain almost 100 per cent fewer bacteria than unoiled ones in similar use.

Robertson [28] reports the results of instituting oiling procedures in the Chicago Lying-In Hospital on the bacterial content of the air in one, two, and four bed wards, operating room, birthroom, and nursery during the months of February to May, 1946. All articles of clothing coming to the hospital laundry were treated with the T-13 oil emulsion formula [2] with the exception of the personal clothing of internes and nurses. The percentage reduction of air-borne bacteria brought about by oiling was greatest in the rooms containing 4 patients (90 per cent) and least in single rooms (40 per cent). In the nursery where the bacterial count was lowest initially, the reduction after oiling was very slight.

In 1944, Wright and coworkers [29] reported a highly favorable study on the use of oiled bedclothes and floors in preventing cross-infections due to the hemolytic streptococcus in measles wards. When these methods were employed, the streptococcal (type 6) cross-

infection rate among the patients fell from 58.1 per cent during the preliminary period with oiled floors alone to 18.6 per cent when, in addition, oiled bedclothes, garments, and ward linen were used. The cross-infection rates for the same periods in the unoiled wards were 53.5 per cent and 73.3 per cent, respectively.

Recognizing the difficulty of drawing conclusions with respect to the value of dust control procedures for the prevention of hospital cross-infections form a single study, Wright and associates [30] carried out a similar study the following year (1945) on the measles wards of another hospital. Similar methods were employed [26] and a more rigid aseptic technique was instituted to reduce the possibility of other modes of spread. As was found in their previous study [29] the oiling methods effected a marked reduction in the total bacterial and streptococcal counts in the air of the test ward. Thus, the reduction in the mean total bacterial count and hemolytic streptococcal count of the air of the oiled wards during bedmaking was 92.3 per cent and 94.7 per cent, respectively, and during floor sweeping, 79.1 per cent and 95.9 per cent, respectively, when compared to counts obtained in the air of the control ward during similar periods of activity.

In contrast to the favorable clinical results obtained in their 1943 study, the cross-infection rate, although low on both wards in 1945, was actually higher (20 per cent) in the oiled than (12.4 per cent) in the unoiled ward. The authors found these results difficult to explain. They point out that both wards had a comparatively low cross-infection rate of the same order as the 18.6 per cent rate which was regarded as satisfactory for the oiled ward in the 1943 investigation. The low degree of aerial contamination by streptococci in both wards suggested that the cross-infections were caused by a mode of spread which was not air-borne. Two factors are presented which possibly explain the higher cross-infection rate on the test ward—(a) a higher admission rate of type 12 streptococcus, the only streptococcal type which showed signs of "communicability" and "virulence," and (b) a higher admission rate of skin sepsis and streptococcal otorrhea cases.

The absence of a markedly virulent "communicable" strain of streptococcus on the wards in the 1945 study was in striking contrast to the condition on the wards in 1943. In the latter investigation, only one group A streptococcal type (type 6) was responsible for the high cross-infection rate and complications on both wards before and on the control ward after oiling methods were instituted. In the 1945 study, numerous types and groups of hemolytic streptococci were isolated from the cases of cross-infection. Thus, the conditions favorable for the spread of streptococci in measles wards vary from one epidemic year to another.

Wright and her coworkers conclude "that the results of the 1945 investigation need in no way discourage further trials of dust suppression by oiling. Should unfavorable conditions of 1943 recur in subsequent measles epidemics, dust control may again assume importance as a measure of preventing infection."

SUMMARY AND CONCLUSION

1. Recent studies suggest that the indirect spread of respiratory tract infections from the inhalation of dust-borne bacteria is more important than by the direct inhalation of infectious droplets or droplet nuclei. The relative importance of droplet nuclei and dust-borne particles in the spread of virus infections is not known. More exact knowledge concerning the size range of dust-borne particles and droplet nuclei containing bacteria and viruses is essential to evaluate further methods for

the control of infections spread by the air-borne route.

2. An apparatus for sizing liquid and solid aerosols has been reported. This instrument, or a modification of it, appears to be adaptable to the study of size ranges of naturally dispersed droplet nuclei and dust-borne particles carrying bacteria and viruses.

3. Recent studies confirm the results of earlier investigations[2, 23] that to oil floors and bedclothes for the control of dust-borne bacteria is a highly efficient procedure. The use of the T-13 oil emulsion formula for the treatment of bedclothes with oil in a civilian hospital has been demonstrated. The incorporation of germicidal agents into oil-in-water emulsions to increase their efficiency merits further study.

4. Two studies by the same investigators have been reported which show that in 1943, dust suppressive measures effected a marked and significant reduction in the incidence of cross-infections due to a highly communicable strain (type 6) of hemolytic streptococcus on a measles ward; but in 1945, when the incidence of cross-infections due to numerous types and groups of streptococci was low, no effect was observed. Likewise, in another study, oiling blankets with a germicidal oil-in-water emulsion did not reduce the incidence of secondary infections of burns in a surgical ward.

5. The studies reviewed in this report point up the fact that no respiratory tract infection, whether of bacterial or virus etiology, and no wound or burn infection is acquired only by the air-borne route. The opportunities for spread of respiratory tract infections or of developing secondary infections of wounds and burns by other means than through the air in an environment highly contaminated with infectious dust are many. Direct contact with some object or person in the environment may assume a role of major importance in some situations.

REFERENCES

1. Perkins, J. E. The Present Status of the Control of Air-borne Infections. *A.J.P.H.*, 37:13, 1947.

2. Loosli, C. G. Dust and Its Control as a Means of Disinfection of Air. *A.J.P.H.*, 37:353, 1947.

3. Duguid, J. P. The Numbers and the Sites of Origin of the Droplets Expelled During Expiratory Activities. *Edinburgh M. J.*, 52:385, 1945.

4. Duguid, J. P. Expulsion of Pathogenic Organisms from the Respiratory Tract. *Brit. M. J.*, 1:265, 1946.

5. Duguid, J. P. The Size and the Duration of Air-Carriage of Respiratory Droplets and Droplet Nuclei. *J. Hyg.*, 44:471, 1946.

6. Hare, R., and Mackenzie, D. M. The Source and Transmission of Nasopharyngeal Infections Due to Certain Bacteria and Viruses. *Brit. M.J.*, 1:865, 1946.

7. Hamburger, M., Jr., Green, M. J., and Hamburger, V. G. The Problem of the "Dangerous Carrier" of Hemolytic Streptococci; II. Spread of Infection by Individuals with Strongly Positive Nose Cultures Who Expelled Large Numbers of Hemolytic Streptococci. *J. Infect. Dis.*, 77:96, 1945.

8. Hamburger, M., Jr., Puck, T. T., Hamburger, V. G., and Johnson, M. A. Studies of the Transmission of Hemolytic Streptococcus Infections; III. Hemolytic Streptococci in the Air, Floor Dust, and Bedclothing of Hospital Wards and Their Relation to Cross-Infection. *J. Infect. Dis.*, 75:79, 1944.

9. Hamburger, M., Jr., and Green, M. J. The Problem of the "Dangerous Carrier"; IV. Observations Upon the Rôle of Hands, of Blowing the Nose, of Sneezing, and of Coughing in the Dispersal of These Microörganisms. *J. Infect. Dis.*, 79:33, 1946.

10. Hodges, R. G., Capt. M.C. A.U.S., and MacLeod, C. M. Epidemic Pneumococcal Pneumonia; II. The Influence of Population Characteristics and Environment. *Am. J Hyg.*, 44:193, 1946.

11. Stillman, E. G. Further Studies on the Epidemiology of Lobar Pneumonia. *J. Exper. Med.*, 26:513, 1917.

12. Edward, D. G. ff. Resistance of Influenza Virus to Drying and Its Demonstration on Dust. *Lancet*, 2:664, 1941.

13. Commission on Acute Respiratory Diseases. A Laboratory Outbreak of Q Fever Caused by the Balkan Grippe Strain of Rickettsia Burnetti. *Am. J. Hyg.*, 44:123, 1946.

14. Huebner, R. J. Report of an Outbreak of Q Fever at the National Institute of Health. *A.J.P.H.*, 37:431, 1947.

15. Bourdillon, R. B., and Colebrook, L. Air-Hygiene in Dressing-Rooms for Burns or Major Wounds. *Lancet*, 1:256 and 601, 1946.

16. Jennison, M. W. Atomizing of Mouth and Nose Secretions into the Air as Revealed by High-Speed Photography. *Aerobiology*. American Assn. for the Advancement of Science, 17:106, 1942.

17. Hatch, T. F. Behavior of Microscopic Particles in the Air and in the Respiratory System. *Aerobiology*. American Assn. for the Advancement of Science, 17:192, 1942.

18. Davis, C. N. Filtration of Droplets in the Nose of the Rabbit. *Proc. Roy. Soc.*, Series B, 133:282, 1946.

19. May, K. R. The Cascade Impactor: An Instrument for Sampling Coarse Aerosols. *J. Sc. Instruments*, 22:187, 1945.

20. Sonkin, L. S. A Modified Cascade Impactor: A Device for Sampling and Sizing Aerosols of Particles Below One Micron in Diameter. *J. Indus. Hyg. & Toxicol.*, 28:269, 1946.

21. Sonkin, L. S. Personal Communication.

22. Landahl, H. D., and Block, S. Penetration of Air-borne Particles Through the Nose. *J. Indust. Hyg. & Toxicol.*, 29:269, 1947.

23. Loosli, C. G., and Robertson, O. H. Recent Studies on the Control of Dust-borne Bacteria by Treatment of Floors and Bedclothes with Oil. *Am. J. M. Sci.*, 209:166, 1945.
24. Rountree, P. M., and Armytage, J. E. Hospital Blankets as a Source of Infection. *M. J. Australia*, I:503, 1946.
25. Rountree, P. M. The Treatment of Hospital Blankets with Oil Emulsions and the Bactericidal Action of "Fixanol C" (Cetyl Pyridinium bromide). *M. J. Australia*, I:539, 1946.
26. Harwood, F. C., Powney, J., and Edwards, C. W. A New Technique for the Application of Dust-laying Oils to Hospital Bedclothes. *Brit. M. J.*, I:615, 1944.
27. Rountree, P. M. Cross-Infection of Wounds in a Surgical Ward During a Trial of the Use of Oiled Blankets. *M. J. Australia*, I:427, 1947.
28. Robertson, O. H. The Dispersal of Respiratory Pathogens in Relation to the Occurrence and Control of Air-borne Infections. *Am. Rev. Tuberc.*, 55:109, 1947.
29. Wright, J., Cruickshank, R., and Gunn, W. The Control of Dust-borne Streptococcal Infection in Measles Wards. *Brit. M. J.*, I:611, 1944.
30. Begg, N. D., Smellie, E. W., and Wright, J. Dust Control in Measles Wards with a Note on Sulfadiazine Prophylaxis. *Brit. M. J.*, I:209, 1947.

CLAYTON G. LOOSLI, M.D., *Referee*
Associate Professor of Medicine
University of Chicago, School of Medicine

Best Sellers in the Book Service for February

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners.	
Part I. Nature and Uses of the Method, 1945	$1.00
Part II. Appraisal of Dwelling Conditions, 1947. 3 Vols	5.00
Color Atlas of Hematology. Kracke. 1947	5.00
Common Contagious Diseases. 4th ed. Stimson. 1947	4.00
The Control of Communicable Diseases. 6th ed., 1945	.35
Diagnostic Procedures and Reagents. 2nd ed., 1945	4.00
Manual of Determinative Bacteriology. 6th ed., Bergey et al., 1948	15.00
Military Preventive Medicine. Dunham. 1940	3.25
Milk and Food Sanitation Practice. Adams, 1947	3.25
Public Health Law. 3rd ed. Tobey. 1947	4.50
Standard Methods for the Examination of Water and Sewage, 9th ed., 1946	4.00
Water Bacteriology. Prescott, et al., 1946	4.50
Your Community. rev. 3rd ed. Colcord. 1947	1.50

Order from the Book Service
AMERICAN PUBLIC HEALTH ASSOCIATION

American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 38 March, 1948 Number 3

Editorial Board

REGINALD M. ATWATER, M.D.
Chairman, and Managing Editor

LEONARD GREENBURG, M.D.
PROFESSOR JOHN M. HENDERSON
RALPH S. MUCKENFUSS, M.D.
STUART MUDD, M.D.
RAYMOND S. PATTERSON, PH.D.
GEORGE ROSEN, M.D.

C.-E. A. WINSLOW, DR.P.H.

C.-E. A. WINSLOW, DR.P.H., *Editor*
AUGUSTA JAY, *Editorial Associate*

FRUITS OF THE PRINCETON CONFERENCE

THE fact that approximately one-third of the population of the United States lives in areas which lack the essential services of a full-time health officer has long been a subject of concern to our Association. Dr. Haven Emerson's Subcommittee on Local Health Units has provided us with full data on this point, has suggested definite and practical ways in which this vital health need of the nation could be met, and has fought gallantly for the cause for the last five years. During the past six months public interest in the subject has at last been aroused on a wide scale, and the promise for future progress is now bright.

A Conference was held at Princeton last fall under the auspices of the American Public Health Association which brought together representatives of 65 national citizens' organizations representing some 50,000 local and state branches whose membership constitutes a large part of the adult population of the country.[1] At this Conference, the representatives of these agencies discussed the findings of the Subcommittee on Local Health Units of the Committee on Administrative Practice[2]; the citizen agencies present, by resolution, urged their respective agencies to use all their influence to get complete coverage of the nation with health units of such area and population as to be economically efficient and justifiable.

Since September, the published Proceedings of the Princeton Conference[3] (as well as four special bulletins of information) have been sent to the participating agencies. The National Health Council—as the appropriate body representing voluntary citizen participation in the health program—has accepted leadership in developing a nation-wide campaign for universal full-time health service. Its first major step was the calling of a planning meeting in New York on January 23. To this recent Conference, 47 of the Princeton agencies sent delegates at their own expense. They voted that a national advisory and coördinating committee be created under the National Health Council which would develop programs, educational materials, hold regional meetings, and give staff advisory service to local committees and councils seeking to extend local health services. Resolutions of the Conference[4] state "that the goal is to obtain complete coverage of all states and all communities by local full-time health units under competent professional direction." They ask:

That the National Health Council be requested to create a National Advisory Committee on Local Health Units composed of responsible representatives of interested organizations.

That this committee seek to develop a central program advisory service, materials and such other clearing house functions as may prove desirable.

That the national organizations be encouraged to begin stimulation of state and local action to obtain the necessary local health units.

That each organization be encouraged to develop a specific program of action adapted to its structure and character.

That each organization urge its state and local affiliates to work coöperatively with existing state-wide and local coöperating agencies or councils in order that there may be a pooling of interests, planning and action in securing complete coverage.

Among the items discussed by the Conference was the increase in local full-time health service that has actually taken place since July, 1947. In the last six months of 1947, 16 new counties were brought under the umbrella of full-time local health service. This has come about by the creation of only three new health departments, because consolidation of counties or of cities and counties has been even more active than the creation of new departments. Buffalo and Erie County in New York, for example, with a population of nearly one million; Seattle and King County, Washington, with more than half a million persons, have each consolidated their health departments, as have Charleston and Kanawha County in West Virginia. South Carolina is serving the entire state with six fewer local health departments than it had six months ago. Indiana has organized the first bi-county health department in its history.

At the January meeting, the agencies represented reported a surprising degree of activity already carried out by them in furthering this plan. The national Congress of Parents and Teachers has undertaken to sponsor a federal bill providing specifically for grants-in-aid to encourage local health service. Both the National Tuberculosis Association and the National Society for the Prevention of Blindness have adopted as a part of their national platforms coöperation with other agencies in developing community health services. Some of these activities were reported in the January *Journal*[5]; others will be reported elsewhere. That there should have been such an outpouring of interest as a result of the first bringing together of representatives of the general public in behalf of extending local health units, gives us hope that the presently underprivileged third of the nation with respect to health protection may, in the foreseeable future, enjoy those minimum health services which every citizen has a right to expect from his local government.

REFERENCES

1. The Princeton Conference on Local Health Units. *A.J.P.H.*, 37, 11:1502–1505 (Nov.), 1947
2. Emerson, Haven, M.D. *Local Health Units for the Nation.* New York: Commonwealth Fund, 1945. 233 pp.
3. *Proceedings of the National Conference on Local Health Units,* Sept., 1947. A.P.H.A.
4. See page 456.
5. Ripples from the Princeton Conference. *A.J.P.H.*, 38, 1:108–109 (Jan.), 1948.

NEW DEVELOPMENTS IN TRICKLING FILTER OPERATION

SINCE the trickling filter was developed nearly half a century ago and the activated sludge process was introduced in 1913 and 1914, there have been many useful advances in mechanical detail; but the underlying principles of sewage treatment have remained essentially stable. In the past decade, however, new concepts of the working of the trickling filter have been developed which permit a radical improvement in the efficiency of that valuable method of sewage treatment.

It has long been known that the trickling filter could operate successfully for short periods at very high rates; and it was gradually recognized that the limitation of the load which such a filter would carry was related to the clogging which results from an increase in the zoögleal films which develop on the surfaces of the filtering material.

Actually, little biochemical oxidation occurs as the liquid passes through the filter. The oxygen-demanding constituents are physically removed from the flow, accumulate on the filter media, undergo oxidation, and eventually are "unloaded."[1] In serving the dual purposes of separation and subsequent oxidation of organic material, the efficiency of the filter in removal of B.O.D. per unit volume is much decreased. In addition, older methods of surface distribution provided unequal utilization of all portions of the filter bed.

For many years it had been observed that the recycling of certain strong trade wastes through a filter increased the ultimate purification obtained.[2] The advantages of securing uniform distribution of the waste over all portions of the filter bed were also recognized. Realization of the importance of these principles in the treatment of municipal sewage seems to have arisen concurrently in England, Germany, and the United States during the early 1930's.

The resulting modifications of the trickling filter which have been worked out and are now available to designers, are numerous. They range from single or two-stage filtration with recirculation, developed in this country; to alternating double filtration and enclosed aerated filters, experimented with in the British Isles. Each of the suggested flow sheets may have an application under certain conditions, but each must be custom-built to the problem at hand. Together, they constitute a formidable challenge to the conventional trickling filter and the activated sludge process, and can also compete with chemical precipitation where only partial treatment is desired. This challenge is not to be interpreted in terms of treatment superiority alone, but on the basis of economy in construction and operation and of flexibility in meeting unforeseen changes in quantity and quality of sewage. The substantial ability of the conventional filter to take "shock" loads is attained at the expense of low efficiency per volume of filter during normal operation.

The development of "high-rate" filters in the United States was greatly stimulated by a 1940 report of civilian consulting engineers on sewage treatment policy at military installations. The report suggested that the new filters would provide an acceptable method of treatment in many cases, for reasons of economy, and because temporary use of the installation would minimize the importance of any unexpected difficulties which might arise due to lack of experience with the new processes.

The exhaustive study of the National Research Council on Sewage Treatment at Military Installations[3] has added greatly to the knowledge of "high rate" filters as well as other types of treatment. It deserves the closest study by authorities responsible for sewage treatment in civilian communities.

At present it is estimated that over 300 communities in the United States have adopted one form or another of "high rate" filter treatment. Loadings of B.O.D. per cubic yard of media vary from 1.5 to 5 lbs. compared with 0.25 lbs. in conventional filters. For typical municipal sewage the permissible increase in loading can result in up to 90 per cent reduction in the amount of filter rock required, and major savings in the cost of filter structure and area of site. Additional costs of pumping, and of increased sedimentation capacity, to some extent reduce the savings described. Performance of the plants varies from that to be obtained

with chemical treatment to that of a well operated activated sludge plant, depending on the intent of the designer. Nitrification and bacterial removal at high loading are less complete than with conventional filters.

In several ways, the behavior of high capacity filters is intermediate between old-style filters and activated sludge. Since biological growth is discharged continuously, without oxidation in the bed, it is greater in volume than trickling filter humus, but less difficult to digest and dewater than activated sludge. Repumping is required for circulation; and power costs are apt to be between those for conventional filters and activated sludge since the pumping of sewage against low heads is more economical than the use of compressed air.

Requirements for technical supervision vary, but in many cases are comparable to those at conventional trickling filter plants.

The contribution of industry in providing highly efficient low-lift pumps, and improved mechanisms for distribution of liquid on the filter have been an essential corollary to the improvements described. Wide experience has now been obtained with a variety of flow sheets on typical domestic sewage, on various industrial wastes and on mixtures of both.

Designers should endeavor to provide the greatest flexibility possible in these types of plants. Arrangements to change the amounts of recirculated liquid, and to pump filter or secondary effluent into the primary clarifier or to the filter should be included.

The economy of high capacity filters is of particular interest with present construction costs, which are almost 100 per cent above those of pre-war, and with many treatment plants approaching the limit of their capacity. In some cases provision of recirculation equipment alone may render it possible to increase markedly the capacities of existing filters or to compensate for insufficient sedimentation capacity.

In resort areas, or where industrial activity is seasonal, it is sometimes feasible to provide conventional filters for a low winter load which can be operated as high rate units during the greater flow and concentration of the summer.

There is also an increasing need for economical methods of industrial waste treatment to meet desired stream standards. Here too, the newer filter applications are worthy of consideration. Combinations of open earth lagoons and high capacity filters particularly merit consideration in this regard.

In Britain due to curtailment of new construction, much of the recent work has had the objective of increasing filter capacities without major changes in equipment or structures. This has necessitated the use of loadings in the neighborhood of 0.35 lbs. of B.O.D. per cubic yard which would not be classified as "high rate" operation in this country.[4] In addition, British practice regards the production of a well nitrified effluent as desirable with the smaller stream dilution usually available there. There is also less tendency to rely on chlorination for good bacteriological results. For equivalent performance, recommended filter loadings in the two countries do not vary substantially.[2]

REFERENCES

1. Phelps, E. B. *Stream Sanitation.* New York: Wiley, 1944, p. 88.
2. Hurley. British Sewage Treatment Practice. *Sew. Works J.*, Jan., 1947.
3. Sewage Treatment at Military Installations. *Sew. Works J.*, July, 1946.
4. Critical Review of Literature of 1946. *Sew. Works J.*, Mar., 1947. Two-Stage Bio-Filter Operation. *Public Works*, Dec., 1947.

A DREAM

THE Health Officer dropped in at the Club late one afternoon (shall we say, for a cup of tea?). The Professor was in one of the two really comfortable chairs before the window, and he sank back in the other with a sigh of relief. Of course, the Professor was bound to talk—he was always talking—but you didn't have to listen.

The Professor was full of beans this afternoon. "Joe," he said, "you should have been at that meeting in Washington last week. They're beginning to make plans for a President's Conference on Childhood and Youth. We shall really have a program by then, a program which will visualize the child as a person—a human being—not a dissected jig-saw puzzle with one piece labelled 'Health,' and one 'Recreation,' and one 'Education.' We're going to put the pieces together and make a real picture."

There was a good deal more of this, and the Professor's voice was soothing. The Health Officer was tired that afternoon. He drowsed off a bit and had a dream.

He dreamed that he was sitting at the head of his conference table at the office, with eight men and two women gathered about the table. He was telling them about a recent intensive study of the boys and girls in the city's largest high school. He reviewed the physical defects revealed by this study, the lack of sound health knowledge, the emotional maladjustments and social frustrations which had come to light. He urged a real coöperative effort on the part of all the social forces which bear on the health of the child.

He asked the Commissioner of Education what could be done to build a really unified program of health education, in which the physical examination of pupils could be integrated with day-by-day instruction in the classroom. Of course, there were no conflicts between the two departments; but arbitration of grievances is not coöperative planning.

He called on the Secretary of the County Medical Society for suggestions as to what could be done to secure more complete correction of the physical defects found in school children. What could the individual physicians do to meet this situation and what should the city do to supplement their efforts?

He raised a question or two with the Director of the V.N.A. as to what its nurses in the home could accomplish in closing the gap between diagnosis and treatment and pledged his support to the Association in its effort to get more nurses and raise their salaries to a more adequate level.

He reviewed, with the psychiatrist heading the Child Guidance Clinics, the notable accomplishments of those clinics on the one hand, and their quantitative inadequacy to meet the real needs of the community, on the other.

He questioned the Commissioner of Charities as to the figures set for forming relief budgets and their relation to the actual costs of living.

He drew out from the Director of the Family Society a statement in regard to the expert counselling given in border-line households as to budgeting and management, advice which may make reasonably normal family life possible even on a substandard income.

The Commissioner of Parks and Playgrounds was called on for a statement as to the facilities for recreation which are so vital in connection with building the physical and emotional and social health of youth.

The pastor of one of the leading parishes presented his views on the indispensable contribution which the Church could make to a full-valued personality.

The Chairman of the Housing Authority was there too; and he pointed out the vital service which public low-rent housing was rendering in the rehabilitation of the home as a corner-stone of community living.

The State Commissioner of Labor and Industry happened to be in town and he contributed something on the relation of sound child labor laws to the common cause.

At this point, a heavy truck thundered by outside. The Health Officer woke up and said, "Oh well, it was only a dream!" And the Professor was still talking.

THE VIRUS OF A COMMON COLD

IT is a challenging circumstance that the commonest type of communicable disease to which the human race is subject—and the one which causes more days of disability than any other—should remain so largely a mystery. Some "colds" are probably physiological in origin, but others occur in sharply marked community evidemics. The "common cold" is probably not one disease but many from an etiological standpoint; and how closely the specific organisms concerned are related, no one can say with certainty. A very high degree of specificity of symptoms may be manifest in a given place and at a given time, while quite a different picture is presented in another epidemic.

That some infections of this type are due to filterable viruses, has been demonstrated for more than thirty years. Now, for the first time a specific virus, identified as the cause of a typical "cold in the head" has been cultivated by Topping and Atlas of the National Institute of Health.[1] This virus has been carried through seven successive passages in allantoic fluid and shows no decrease in virulence, but instead stabilization of virulence at a rather high level. Of sixty volunteers inoculated intranasally with allantoic fluids or fluids from embryonated hen's eggs, 57 have exhibited a characteristic and uniform syndrome.

This is a substantial forward step in the study of the minor, but immensely important, infections of the upper respiratory tract. The duplication of these observations by other workers in the presence of clinically similar infections should prove of the greatest importance, particularly if means can be devised for comparing the effects of the viruses isolated and their mutual immunological relationships (assuming—as common experience would suggest—that such infections are followed by a temporary state of immunity). Topping and Atlas have opened the door to a road which may lead to a real understanding of this vital health problem.

REFERENCE

1. Topping, N. H., and Atlas, L. T. *Science*, 106:636 (Dec. 26), 1947.

Credit Lines

HELPING THE COMMON MAN TO UNDERSTAND

The process grows apace of bringing public health to the average man in his own language. Five recent examples are of interest:

One is "Our Neglected Insane" by George S. Stevenson, M.D., Medical Director of the National Committee for Mental Hygiene in the October 28 issue of *Look Magazine*. With more pictures than words, it tells what are the usual conditions in mental hospitals, and gives five suggestions on "What you can do to help." Number 5 of these suggestions is perhaps the most thought provoking. It is, "You can read the fourth chapter of Genesis, 9th verse, and think through the meaning of those famous words: 'Am I my brother's keeper?'"

The *American Magazine* for December, under the title "Flu Doctor," tells briefly the story of the influenza vaccine developed from fertile hen's eggs by Thomas Francis, M.D. Dr. Francis, it will be remembered, received one of the Association's 1947 Lasker Awards. The *American's* story includes a picture of Dr. Francis working in his laboratory.

Look Magazine's December issue, in "The Hospital Goes Home," tells how Montefiore Hospital in New York is sending chronically ill patients home and still providing them with modern hospital care. Mostly in pictures, this tells of a unique experiment in home care using doctors, nurses, social workers, and housekeepers.

The *Country Gentleman* for September (in its Country Gentlewoman Section) has "A Picture of Health" by Laura Lane in which the community implications of the Hospital Survey and Construction Act are explored, with particular emphasis upon what each citizen can do about his health and that of the community.

Parents' Magazine for October, 1947, in an article, "They Eat Breakfast in Cedar Rapids," tells with suitable illustrations and typical menus how Cedar Rapids, Iowa, became "good breakfast" conscious "over-the-back-fence," as it were.

BLITHE IS BORN

"Blithe," which stands for Better Living in Illinois Through Health Education, stepped into the public health education scene in October, 1947, with Volume 1, No. 1. This is to be a monthly clearing house for the exchange of ideas, published by the Illinois State Health Department whose Director of Health Education is Margaret Cowdin. A feature of the first issue is a detailed account of the organization of the Adams County Health Council. In this county, the city of Quincy and the county are organizing a joint health department which will be in effect on a full consolidated basis by July 1, 1948.

A.D.A. FORECAST

This is the name of the new monthly publication of the American Diabetes Association, Vol. 1, No. 1, which appeared in January. It is a national magazine for diabetics and the general public giving information about diabetes and its control. The first 2 copies off the press were presented to Charles H. Best, M.D., co-discoverer of insulin, and Elliot P. Joslin, M.D., of Boston, world renowned authority on diabetes, at a special ceremony in New York on December 12.

The editor of the Journal is Elizabeth M. Mullmann, formerly editor of the Philadelphia Metabolic Society Quar-

terly which has been discontinued in favor of the new magazine. Publication office is One Nevins Street, Brooklyn 17, N. Y. Subscription price is $2 a year, 25¢ a copy.

TEXAS HAS A PUBLIC HEALTH JOURNAL

A new member of the fraternity of monthly public health journals is the *Texas Journal of Public Health*, Vol. 1, No. 1, which first set up a lusty cry in November, 1947. This is the organ of the Texas Public Health Association which already has a history of a quarter of a century. The leading article in this first issue is "How a Health Department Functions in a Disaster," which tells how the Galveston County Health Department operated in the Texas City Disaster, "the one organization on the mainland capable of doing relief work within one hour after the initial explosion." The editor is Mary E. McNeill and the address is Court House, Dallas, Tex.

DENVER'S CAPSULE REPORT

The 30th Annual Report of the Denver Tuberculosis Society is primarily a spot map showing tuberculosis cases in the city, of which a new one is reported every 15 hours. But on the edges and the back of the map, it manages to report on 16 activities carried out during the year, on its plans for 1948, and to mention 5 items under "Here's How You Can Help," as well as to summarize its finances, thank its volunteers, and print the names of its officers. A good example of effective brevity.

MEDICAL RESEARCH ON THE AIR

A weekly "Research Report," now being used by 54 broadcasting stations, is being prepared by the National Society for Medical Research. This society, whose President is Anton J. Carlson, M.D., was organized in 1946 as an outgrowth of the New York State Medical Society's successful campaign against the enactment of anti-vivisection legislation in that state.

The weekly 15 minute radio scripts constitute a resumé of the activities, achievement, and adventure of medical science. Nor is the material confined narrowly to activities in the United States. A recent weekly script (Research Report XVII) discussed British Anti Lewisite, the new chemical approach of Swedish Professor Holgar Hyden of the Stockholm Karolinska Institute toward the mentally ill, and a brief story of vitamins up to date, beginning with Casimir Funk in Poland and his work on beri beri in sailors. All this material should be a good antidote to the quackeries that disturb the air waves.

The society also publishes a bimonthly bulletin devoted to the problems raised by anti-vivisection campaigns. The Jan-Feb., 1948, issue (Vol. 2, No. 3) lists a number of excellent articles on animal experimentation that have been reprinted and are available without charge. These should be of particular interest to health educators. National Society for Medical Research, Chicago 2.

STATE LEGISLATION AFFECTING PHYSICIANS

The *Journal of the American Medical Association* performs a real service for its members in summarizing in one place 1947 state legislation of interest to physicians. In the Organization Section of the November 29, 1947, issue (Vol. 135, No. 13), George E. Hall of the Bureau of Legal Medicine and Legislation, under 9 main headings such as allied professions, hospitals, foods and drugs, control of disease, and medical and hospital insurance plans, summarizes the legislation with full footnote references to the specified laws.

CONNECTICUT TAKES THE NEXT STEP

Connecticut has long had a permissive local health district law; its 1947 legis-

lative session enacted a bill for state aid to such districts. The next logical step has now been taken—a suggested plan by the State Health Department for grouping the 169 municipalities of the state into health districts, each of which would have a health center built as a part of the hospital and health center construction program.

Under this plan the state is divided into 8 hospital areas but the three alternate plans for health districts range from 28 to 31. Of the 28 districts in one plan, 13 had an estimated 1946 population of less than 50,000, 5 of less than 40,000.

The hospital and health center plans are outlined in *Connecticut Hospital and Public Health Center Survey Report* which is available from the Connecticut State Health Department, Hartford.

YOUR HEALTH DEPARTMENT

The Cattaraugus County (N. Y.) Health Department has prepared an 8 page leaflet to help residents understand and use the services of their health department. Entitled "Your Health Department," it has a picture and a short description of each of the department's activities together with a directory of the district subcenters. Emphasis is upon the services; no space is used to list important names.

CLEVELAND CATCHES RATS

Cleveland celebrated Rat Week, December 1–6, by killing off all the rats that could be found by the combined efforts of the citizens. The Junior Chamber of Commerce gave $25 to the first person who brought in 40 rat tails, and a similar award to the person bringing in the largest number during rat week. The Cuyahoga Rat Control Organization also awarded $25 to the professional exterminator who brought in the greatest number of rat tails. The City Health Department publicized procedures for rat proofing.

"The serious shortage of food in the world" is the first item in the reasons given for this special drive on rats.

POLIO AND PEOPLE

One of the new publications preparatory to the 1948 March of Dimes campaign is "Polio and People." It is significant for the simple and sympathetic way in which it tells what services the individual family with a polio sufferer may expect from his local chapter and what are the jobs still to be done in wiping out infantile paralysis. As such it is a useful model for other health education material. *Publication No. 66*, National Foundation for Infantile Paralysis, 120 Broadway, New York 5.

DENTAL HEALTH EDUCATION

On the theory that children's books are especially suited to the mind and interest of children, the Georgia State Health Department makes the text and illustrations of *Frank Visits the Dentist* look and sound like a story book for small children. Short conversational sentences and brightly colored illustrations help the child to think of the dentist's visit as an interesting adventure. With the pamphlet also are book marks with five dental slogans, each reproduced in five colors. Available from Annie Taylor, Educational Director, Division of Dental Health, Georgia Department of Public Health, Atlanta 3.

PROMOTING PUBLIC HEALTH NURSING

The kit for the 1948 National Public Health Nursing Week, April 11–17, has been distributed. It is intended primarily for local committees sponsoring the "week" in local communities but also is useful in a year round program of public information. It is attractively packaged and has good promotional material with varied appeal. National Organization for Public Health Nursing, 1790 Broadway, New York 19. $1.00 per kit.

Section Highlights of the 75th Annual Meeting

SUMMARIES of Section highlights at the 75th Annual Meeting of the Association as seen through the eyes of the Section Secretaries are shown below. It is the hope that these will bring to the many members who could not get to Atlantic City something of the flavor and content, in capsule form, of the Sections' scientific meetings. Eight of the Section secretaries have prepared such summaries. They are herewith presented, beginning with the earliest Section organized.

LABORATORY SECTION, GEOFFREY EDSALL, M.D., *Secretary:*

The expanding scope of public health laboratory activities was strikingly illustrated by the variety of material which was discussed at the sessions of the Laboratory Section in Atlantic City. Papers on methods for detection of occult blood in the presence of iron salts, on the cell smear method of diagnosing cancer, on the use of chick embryo smallpox vaccine (on a larger scale than has been tried heretofore in this country), and a lively group of papers on various aspects of Rh typing, were representative of the range of interests to be found in the sessions of this Section.

Of special interest to diagnostic workers were reports on micro techniques for rapid identification of pathogenic organisms, on limitations of the rectal swab method for diagnosis of enteric disease, and on the latest results of a coördinated study of various gonococcus media. The meetings were also enlivened by the presentation of different points of view with regard to the best technique for identification of diphtheria bacillus.

The joint session of the Laboratory Section with the Conference of State and Provincial Public Health Laboratory Directors provided a setting for some of the most informative material that was presented at the meetings. Other joint sessions yielded information of a variety too great to be condensed. in a paragraph, but among the highlights may be mentioned: a significant report on the effect of diet on susceptibility of rats to typhus; an up-to-date report of the status of the microbiology of frozen foods; a series of papers which defined and explained some of the obscure factors which determine good or bad dishwashing; a group of papers expounding the applications of statistics to laboratory procedures; and a panel of reports on the current status of immunization procedures.

Also of interest was a luncheon session—the first held by the Section in several years—at which Dr. Stuart Mudd and Dr. Robert S. Breed reported on the recent International Microbiological Congress.

Two developments of major interest to the Section with regard to standard methods should be reported: first, that Dr. Archie Robertson was able to display a galley proof of the forthcoming 9th edition of *Standard Methods for the Examination of Dairy Products;* second, that the standard methods work heretofore developed and handled by the Laboratory Section and other sections has been raised to the level of an Association activity through establishment of a Coördinating Committee on Laboratory Methods under the Committee on Research and Standards. This promises to tie together the related

activities of the various Sections in this field in a way hitherto impractical and to expedite the production of published results of the work of these committees.

HEALTH OFFICERS SECTION, JOSEPH G. MOLNER, M.D., *Secretary:*

The Health Officers Section meetings at the 75th Annual Meeting of the American Public Health Association at Atlantic City were unusually well attended and interest in the subject materials of the speakers was apparent.

An interesting panel discussion on "The Essentials of Good Local Public Health Administration" was conducted by panel leader, Dr. V. A. Van Volkenburgh. This panel was composed largely of local health officers at city and county levels and included also Dr. Carl E. Buck, Field Director of the American Public Health Association.

The panel discussed the problems that face local health officers, particularly the shortage of personnel and the inadequate training of existing personnel. Good personnel management, budgeting, and the relationship of the health department to other agencies were also discussed. Audience participation at this panel discussion was exceptionally good.

Visitors from Great Britain, Sir Andrew Davidson and Sir Allen Daley, discussed the impact of the war upon post-war public health. It was rather fascinating to learn that their problems were not greatly different from ours. Sir Allen Daley pointed out specifically that there is a definite tendency in Great Britain toward affiliating hospital with public health services.

Dr. Bruce H. Douglas, Health Commissioner of Detroit, presented the problems that face a large American city. These three speakers brought out vividly the difficulties which public health agencies in Great Britain and in this country are presently encountering, and also offered suggestions as to ways and means of meeting these problems.

An interesting paper was presented by Dr. Hart E. Van Riper, Medical Director of the National Foundation for Infantile Paralysis, on the subject, "Can Public Health Agencies Handle Poliomyelitis Alone?" He pointed out that the cost of care of infantile paralysis victims, particularly with modern methods of therapy, is almost prohibitive. Outbreaks of poliomyelitis are apt to be rather sudden and are, of course, unpredictable. Generally speaking, governmental agencies when making appropriations for public health do not make allowance for unpredictable outbreaks of poliomyelitis. He stated further that often emergency appropriations through these channels require long periods of time.

It is difficult to emphasize fully the significance of another paper presented at this session, namely, "How Much Control of Cancer?" by Drs. Earle G. Brown and Joseph H. Kinnaman of the Nassau County (New York) Health Department. The authors indicated clearly that the health agency will ultimately have as an important responsibility the problems of cancer control and cancer education programs.

The last session of the Health Officers Section was devoted to a series of papers on Hospital Relations. Here was discussed the rôle which the hospital can play in a public health program, both through its physical facilities and through an active sharing program. The proposed and already existent hospital programs in New York State, Saskatchewan, and Indiana were described in detail, together with the practical application of combined hospital and health center programs, particularly in the Latin Americas. It appeared from this series of papers that an increasingly closer relationship is being developed between hospital and public health programs, to the advantage of both hospital and public health services.

VITAL STATISTICS SECTION, CLARA E. COUNCELL, PH.D., *Secretary:*

The Vital Statistics Section had a varied program with discussions of many different phases of work in this field. There were two independent and two joint sessions, one with the Laboratory Section and the Biometrics Section of the American Statistical Association; and one with Epidemiology, Maternal and Child Health, and School Health Sections, and the Council on Rheumatic Fever of the American Heart Association.

The first independent session was devoted to papers on National and International Vital Statistics. These included a comprehensive summary of the major problems of vital statistics registration, by Dr. Bailey, which elicited supporting comments, especially from the registrars. In Dr. Fraenkel's paper on medical attendance during terminal illness there were some new and effective statistics to show lack of adequate medical care in the areas studied.

Dr. Linder described the machinery and accomplishments of statistical activities of the United Nations, and, in the absence of Dr. Curiel, Dr. Neurdenburg of the Netherlands reviewed the status of the proposed International Statistical Classification of Diseases, Injuries and Causes of Death, as well as some of the highlights of the recent International Statistical Conference. Dr. Hedrich presented a proposed set of rules for resident allocation which was approved by the Vital Statistics Section, to be referred to the Committee on Research and Standards.

The round table of representatives from Vital Statistics and other health fields, with Dr. Winslow performing brilliantly as panel leader, provided a helpful picture of what is needed in training for the use of vital statistics. Although some felt that the requirements suggested were certainly ambitious, there was nevertheless a high degree of unanimity of opinion. The discussion presented opportunities for the exchange of useful ideas. It seems to be generally accepted that sound training in methods, with emphasis upon application to practical problems, and increasing use of field work are desirable.

In the business sessions Dr. Puffer, Dr. Linder, and Dr. Councell were re-elected as Chairman, Vice-Chairman, and Secretary respectively. Dr. Moriyama was elected to succeed Dr. Whitfield, whose term expired in 1947. Dr. Watkins was reappointed as Vital Statistics Section representative on the Fellowship Committee of the Association. Mr. Pennell has agreed to serve on the Committee for Membership and Vital Statistics Directory of the Section.

Dr. Densen's report, for the Committee on Remuneration and Standards, summarized the status of the study of background information and salaries of professional personnel.

Mrs. Jones reported for the Committee on Opportunities in Statistical Work that the committee hopes to acquaint qualified persons with job opportunities in public health statistics by publication of a pamphlet on "Careers in Public Health Statistics." A plan was also suggested, for Section and Association consideration, by which travelling fellowships would be made available to vocational guidance officers in colleges so that they might become informed of the activities and opportunities in the field of public health statistics.

The report of the Committee on Membership and Directory read by Miss Bellows indicated that work on the revision of the *Directory* is under way. Several professional societies have already been circularized for prospective members.

FOOD AND NUTRITION SECTION, ALICE H. SMITH, *Secretary:*

The limitation in number of sessions

imposed by the Association membership at the 75th Annual Meeting was not accompanied by limitation of quality in the case of the Food and Nutrition Section. On the contrary, two outstanding sessions were held.

Dr. Johan Latsky of the Food and Agriculture Organization of the United Nations and Dr. Martha M. Eliot of the U. S. Children's Bureau, left no doubt in the mind of anyone present of the urgent need for a sympathetic understanding of the needs of people in war-torn countries. Their words, based upon personal observation, left no doubt about our moral and financial obligation to "do something about it."

The session on Methods for Appraisal of Nutritional Status brought us up to date on projects that have been under way for some time. There was considerable discussion provoked by the papers read, in fact, small groups were still "discussing" forty minutes after the meeting was adjourned.

Dr. Charles G. King reported the progress of a new committee, Sanitary Practices in Food Industries. Although the Food and Nutrition Section has assumed responsibility for the formation of this committee, the membership will consist of representatives of many other sections interested.

The Committee on Remuneration made a progress report and will continue to collect data this year.

The services of the Section Council were offered to the Association Merit System Service.

If you enjoyed the meetings, we hope you will spread the word around and encourage attendance at next year's meeting. We hope, too, that you will feel free to send the Secretary suggestions for next year's program.

MATERNAL AND CHILD HEALTH SECTION, MYRON E. WEGMAN, M.D., *Secretary:*

The Maternal and Child Health Section held one independent session and three joint sessions at the Annual Meeting of the Association. The independent session was devoted chiefly to problems of child development. Dr. Edith Jackson described experiences with a rooming-in project for new-born babies at the New Haven Hospital. Patients for the experiment were selected from mothers who wished to have their babies in the same room with them, a desire apparently present in the majority of mothers. There was general approval of the idea on the part of both parents and nurses despite occasional difficulties. The plan worked particularly well with primiparae.

Dr. C. Anderson Aldrich described a study of the answers to the question, "What behavior does your child have of which you do not approve?" asked of mothers of one year old children. One of the surprising results was that almost two-thirds of the mothers said that their babies did nothing of which they disapproved. This may have been influenced in part by the amount of education in child development which mothers taking part in Dr. Aldrich's clinic had had. It was also obvious that many of the things of which some mothers complained were quite unimportant.

Dr. Margaret F. Gutelius described her experiences with modified self-selection of food for preschool children in the home. On this regime, although there were occasional bizarre departures from the usual meal, the children, nevertheless, over a period of time selected a well balanced diet, grew well, and were well adjusted.

Dr. Kent Zimmerman described the beginnings of a program in the state and local health departments of California, looking toward expansion of activities in mental hygiene and preventive pediatrics.

Dr. Charles L. Williams summarized some of the statistical data resulting

from preliminary analyses of the American Academy of Pediatrics study of child health services.

The general subjects of the joint sessions were immunization, preservice and inservice training, and the rheumatic fever control program.

At the business sessions, in addition to the election of officers for the coming year, the Section heartily endorsed the proposed expansion of official Association activities in maternal and child health through the formation of a special committee, with members drawn from the several Sections particularly interested in maternal and child health. Several resolutions were introduced and four were finally approved for submission to the general Resolutions Committee. It is to be noted that three of the four were finally passed by the Governing Council and promulgated officially. The resolutions recommended: (1) support for the International Children's Emergency Fund, (2) extension of programs for the care of premature infants, and (3) repeal of specific taxes on oleomargarine.

It was pointed out that wider participation by the membership and fellowship of the Section in program planning and activities between annual meetings would make the secretary's task easier as well as make the Section itself more useful.

PUBLIC HEALTH NURSING SECTION, ROSALIE I. PETERSON, R.N., *Secretary:*

The Public Health Nursing Section participated in two joint meetings, one with the Health Officers and Public Health Education Sections, and the Public Health Veterinarians. Mary C. Connor, *Chairman* of the Nursing Section presided as co-chairman and introduced the Public Health Nursing speaker, Marion W. Sheahan, who presented a paper on "The Public Health Nurses' Contribution in the Annual Planning of a Public Health Program."

The other joint meeting was with the School Health, Maternal and Child Health, Public Health Education, and Food and Nutrition Sections, where Miss Connor again acted as co-chairman. Miss Ruth Freeman presented a paper on "The Contribution of the School of Nursing and the Graduate Course of Public Health Nursing," and Hortense Hilbert was a discussant representing Public Health Nursing.

The Public Health Nursing Section had a meeting of its own, in which topics that were of vital concern to nurses today were discussed, namely: "The Public Health Nurse in a Nutritional Appraisal Program" by Mary McLaughlin, "Public Health Nursing in the Cancer Control Program of the U. S. Public Health Service," by Rosalie I. Peterson, and "Field Experience Facilities in Public Health Nursing," by Helen Fisk.

In pre-war days, the Public Health Nursing Section had had its business meeting at a luncheon meeting. This was resumed this year, and approximately 300 persons attended. In addition to the election of officers, reports by the Chairman of the Standing Committees were made. These reports consisted of the one on "Administration" by Marion Sheahan, on "Education" by Ella McNeil, on "Eligibility" by Alberta B. Wilson. All three stressed the stimulation and enjoyment which they had had in serving on these committees. Dorothy Deming gave a report on "The Merit System Examination Program for Public Health Nursing." Interspersed with these reports were delightful solos rendered by a local student nurse. This program was sponsored by the New Jersey State Organization for Public Health Nursing.

A ballot had been prepared for the Nursing Section prior to the meeting which facilitated the voting. The following members were elected to office:

Ruth Freeman, *Chairman,* Margaret S. Taylor, *Vice-Chairman;* Zella Bryant, *Secretary;* Marion H. Douglas, *Section Representative of the Nominating Committee for the Governing Council;* Mary C. Connor, *Section Council Representative for a five year period;* and Alberta B. Wilson, *Nursing member on the Committee on Eligibility.*

In addition to these sponsored programs, nurses participated in other meetings. Miss Sheahan represented Public Health Nursing in a panel discussion on "Basic Training for Vital Statistics," and Mary E. Parker discussed "Nursing Follow-up in a Rheumatic Fever Community Program." This was a joint meeting of the Maternal and Child Health, Epidemiology, School Health, and Vital Statistics Sections, and the Council on Rheumatic Fever of the American Heart Association.

I am sure that you will enjoy the opportunity of working with Zella Bryant. You will find her coöperative, stimulating, and conscientious. I shall also be able to give her suggestions and will be available for discussions. In fact, I have just prepared a memorandum of some of the suggestions which I believe will be helpful. I know that I have left the work as Secretary in good hands and I am equally sure you will enjoy working with her.

PUBLIC HEALTH EDUCATION SECTION, REBA F. HARRIS, *Secretary:*

The 25th annual program of the Public Health Education Section grew out of the work of the membership throughout the past year. While workshop procedures characterized the entire program, a variety of conference techniques was used. These techniques provided a wide range for membership participation in such activities as: presiding at a session, a group conference or a committee meeting; asking questions, giving opinions and taking part in group discussions; mapping plans, compiling and giving committee reports; presenting formal papers; giving active consultant services in the motion picture theater, the Association press room; and rendering service in Health Education and Publicity headquarters, and in other scientific exhibits.

Through the work of the 14 committee chairmen and the Section Council a total of 118 members came to the conference with a specific assignment on the program. It is estimated that 70 to 80 per cent of others present took an active part in some phase of the work during the conference period.

Some of the highlights of the Section program were:

1. The pre-conference planning group composed of Section Council members, all committee chairmen and past officers of the Section for its twenty-five years of existence.
2. The lively business conference at a dinner session with 150 members present.
3. The 12 informal group conferences held by cross-Section and Regional committees with a combined total attendance of 1,130.
4. The two interesting joint sessions with other Sections, and the final session of four formal papers.
5. The exhibits from Hawaii and Canada with formal papers by members from these countries; the coöperative work with the National Publicity Council for Health and Welfare Services, the motion picture theater, and the Association press room.
6. The appointment of a Committee on Mechanics of the Section.

SCHOOL HEALTH SECTION, S. S. LIPSON, *Secretary:*

Attendance at the meetings organized by the School Health Section reaffirms the fact that health programs related to school children continue to interest public health workers.

The reports on research projects were well received. Four studies were presented dealing with anemia in school age children, topical application of fluorides, testing for visual acuity and absenteeism in schools. Combining a business ses-

sion with reports on scientific research proved to be a good combination.

Five Sections co-sponsored a symposium on preservice and inservice preparation in health for school personnel which created considerable interest. Strong sentiment was expressed for publishing and reprinting the symposium papers as a group. The round table summary which completed the symposium was a successful innovation. Representatives designated by the sponsoring Sections discussed the papers from the point of view of their Section interests. Questions from the floor followed.

How well community resources for health education are being used in the school health program was the subject of another session. A panel composed of a county health officer, a school superintendent, and a health educator in a voluntary agency were the discussants. All agreed that health education in schools should make greater use of the health education resources of both official and voluntary agencies.

The School Health Section Council, through which the business of the Section is transacted, met often and long. Several pieces of business will be of interest to the Association membership as a whole.

1. Work was begun on drafting a set of principles to be used when legislation concerning the health program for school age children is under consideration. This is an important step forward since at each session of Congress new bills are introduced dealing with the School Health Program. These can now be considered objectively, on the basis of the principles endorsed by the Section. A committee continues this work on principles. It is anticipated that the final statement will be one on which the several professional groups concerned can agree.

2. Ex-officio representation on the School Health Section Council was accepted by the U. S. Office of Education, the American Association for Health, Physical Education and Recreation—a department of the National Education Association, the American Academy of Pediatrics, and the American Medical Association. The School Health Section benefited materially by their counsel and experience. We wish to take this opportunity to express appreciation for their assistance.

3. The Section was pleased to learn that the National Society for the Prevention of Blindness plans to initiate a comprehensive study of vision testing procedures. At the 1946 Annual Meeting of the Association, the School Health Section Council voted to request the Society to undertake such a study.

4. The School Health Section coöperated in the Health Education and Publicity Headquarters by making consultants available to counsel with members of the Association on various aspects of the School Health Program. Ten members of the Section covered the Consultation Center. Judging from the comments heard, this was a worth while service. This service will be provided again at the next annual meeting. The School Health Section invites the suggestions of Association members on how the consultation service can be of greatest assistance.

5. The Section is indebted to two of its members for a tentative statement on the Relationships of the Voluntary Agencies to the School Health Program. After clearance with interested organizations and agencies, this statement will be widely distributed.

6. The School Health Section Council discussed ways in which its members can be involved to a greater degree than heretofore in the work of the Section. It is recognized that but a small percentage of the membership can get to the annual meeting. It is also recognized that the strength of the Section as well as of the Association is dependent upon the interest and support of the rank and file membership. A concerted effort will be made this year to engage Section members in projects of benefit to the school child.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.

Handbook of Psychiatry — *By Winfred Overholser and Winifred V. Richmond. Philadelphia: Lippincott,* 1947. 252 pp. Price, $4.00.

This book is addressed to the layman. The last paragraph reads, "This book has been written in the faith that the layman wants to know more about psychiatry, and that, rightly informed, he will lose much of his dread of mental abnormalities and be willing, even eager, to join with psychiatry and mental hygiene in helping to advance the campaign for better human beings in a better world." It is a well written, clear, very superficial statement of abnormal psychology, perhaps one might say of descriptive psychopathology, but it contains little of a modern psychodynamic viewpoint. It describes the usual mental illnesses and their etiology, though in the functional psychoses and the neuroses, the etiological concepts extend beyond hereditary determination and an unhappy childhood, neither of which is presented as offering much hope of later reorganization of the personality and recovery. This interpretation of modern psychiatry is hardly in keeping with the views of the practising or outpatient psychiatrist, though it is justifiable in the light of the intramural experience of the authors. As a presentation of classical psychopathology, the book includes the usual, unproved cliches involving causality, but hedges when the issue narrows to the particular case. For example, the impression that schizophrenia is a hereditary disease is clearly stated, but at the same time the statement about whether or not persons with schizophrenic relations should marry includes the following: "If both parties are themselves healthy and normal personalities, the chances of healthy offspring are perhaps as good as the average." While this may be justified in a practical sense in that few clinicians have full faith in the belief that heredity is important in the schizophrenias, it is certainly not a defensible view scientifically.

This would be a good review of psychiatry for the practitioner; it is beyond the grasp of the average layman. Since its concept of mental hygiene is hardly more than implied by the term selection, it has no preventive function.

On page 142, there is an unfortunate misprint of *paranoia* for *paranoid* that is confusing at an important juncture of the development of the book's plan.

PAUL V. LEMKAU

A Survey of the Epidemiological Services in Canada with Recommendations as to Desirable Developments in the Organization and Policy of the Department of National Health and Welfare—*By D. F. Milam, M.D., and W. A. McIntosh, M. D. Ottawa: Edmond Cloutier,* 1947. 57 pp.

This interesting report represents the summation of an intensive study of the needs and inadequacies of the epidemiological services in Canada by Dr. Milam of the International Health Division of the Rockefeller Foundation. Fifteen months were spent in appraising the program then in existence in each of the Provincial Departments of Health, and the report presents recommendations for the organization of a federal Division of Epidemiology. Although preliminary efforts were made to establish such a unit in 1937, this was discontinued with the onset of war and Canada has been essentially without such service except for the functions carried out by the Laboratory of Hygiene.

The report should be of interest not only to those concerned with the coördination of federal epidemiological services but to those in the same field on the state level, since most of the recommendations apply equally well to each state health department. Of particular interest is the discussion of the relative rôles of the Laboratory and the Department of Epidemiology and the arguments pro and con as to the allocation of responsibility for epidemiological investigation, a problem which undoubtedly exists in most state health departments. The discussion and recommendations emphasize the broad applicability of epidemiological principles, not only to the field of communicable disease control but to the work of many other divisions of the health department, as well as to other governmental departments and to university research programs. It is the intent of the recommendations to create a Department of Epidemiology that will coördinate these interrelated projects.

An added valuable feature to the report is the appendix, which presents concisely chronological notes on the development of the Department of National Health and Welfare and other governmental services in Canada concerned with epidemiology. ROBERT F. KORNS

Proceedings of a Conference on Industrial Ophthalmology — *Sponsored by the Columbia University College of Physicians and Surgeons. New York: Columbia University Press,* 1947. 291 pp. 56 illus. Price, $3.00.

This book is a comprehensive postgraduate course in the peculiarities of industrial ophthalmology, its principles and professional relationships. Eyesight in industry includes a fourfold purpose—placement, protection, correction and illumination in visual acuity on the job, and consideration of the employee as a whole. It is demonstrated that a good program for the conservation and utilization of eyesight in industry requires the harmonious efforts of the ophthalmologist, optometrist, psychologist, and safety engineer—without encroachment on the practising specialist. Singular industrial population surveys reveal 15 per cent with serious eye defects; 20–50 per cent require visual help for the job assigned; only 20 per cent above 55 years pass near-point vision tests; six to eight minutes is required for screening and clinical eye tests. Other subjects such as the use of safety goggles, clear and tinted lenses for welders, basic information on illumination, e.g., contrast ratio—1:10, brightness ratios preferably 1:5 for the prevention of fatigue; use of color in the plant; industrial toxic compounds hazards and treatment and industrial first aid in chemical injuries of the eye are included. Scientific facts contributory to optimal and safe use of eyes in industry, and methods in studying the visual demands of the job are presented; research problems, including goggles for spray painting, pooling clinical information on toxicity and chemical neutralization are posed. The book is highly recommended to industrial physicians and hygienists, practising ophthalmologists, and health administrators and educators.

ROY M. SEIDEMAN

Molecules Against Microbes — *By E. S. Duthie. London, W. C. 1: Sigma Books, Ltd., 7 John Street,* 1947. 156 pp. Price, 6s.

The field of chemotherapy has long been ripe for a brief but comprehensive review; and the present volume "is an attempt to give to the ordinary man and woman a picture of how these discoveries were made." If "the ordinary man and woman" in England can follow the formulae of organic chemistry with which Dr. Duthie's volume is replete, the general reading public across the water is much better educated than on this side of the Atlantic. It seems,

however, to the reviewer that the average public health worker in the United States will find the story appealing and helpful, although such a reader may be fired by curiosity as to the almost magical processes by which the chemist determines where a particular side-chain is fixed to an organic molecule and how the chemist succeeds in attaching a desirable side-chain at precisely the right place. Dr. Duthie's simplified formulae are, however, most illuminating to the layman in organic chemistry and his illustrations (including the photograph of the actual culture plate which led Fleming to the discovery of penicillin) throw much light on the subject. Only a very few minor slips can be noted such as the statement that no cocci are motile and the author's acceptance of the old story about the Countess of Chinchon. Mrs. Duran-Reynals has shown that it was the Countess' husband who was responsible and that the tale of the lady's illness was without foundation.

It is a fascinating road upon which Dr. Duthie leads us from emetine and quinine (discovered by the indigenous natives of Brazil and Peru and introduced to Europe in the 17th century); from mercury and arsenic and atoxyl; to Ehrlich's salvarsan in 1909; the preparation of atabrin in 1933; the discovery of prontosil by Domagk in 1932 and the further development of the sulfonamide compounds; the discovery of penicillin by Fleming in 1928 and its practical development during the World War; and finally the preparation of streptomycin by Waksman in 1943.

In reviewing this story one cannot help being impressed by the outstanding contributions of German and Japanese scientists in this field; and one is again astounded that a nation so intellectually constructive as the Germans should also have qualities which lead them to forbid Domagk to receive the Nobel Prize and permitting them to reflood the malarial marshes of Italy prior to their retreat in the second World War.

On the whole, the development of chemotherapy during the past ten years is one of the most extraordinary chapters in the history of science. As Dr. Duthie says, "With powerful chemical weapons now at our disposal in unlimited amounts, and the prospect that others even more effective may at any moment be discovered, there is no sound reason why vast sections of the world's population should continue to live in squalor and disease, and why some of the richest regions of the world should remain in a state of only partial development. In ridding these regions of diseases which now make them dangerous if not unihabitable for man, the chemist, biologist and doctor can play a very big part, if and when they are given the sources and facilities, often denied to them in the past."

C.-E. A. WINSLOW

Lets Talk about Your Baby—*By H. Kent Tenney, Jr., M.D. (3rd ed.) Minneapolis: University of Minnesota Press,* 1947. 115 pp. Price, $1.50.

This small book with weight charts and immunization records is a good supplement to the physician's personal contact with the father and mother of his infant patients. It is written in talkative, entertaining, and yet serious style. A thread of continuity creates personal interest in the reader's mind and is achieved by having several paragraphs in each chapter come as words from the baby's mouth. It is, therefore, easy for the reader to be sympathetic with the fundamental needs of the baby.

Of course, in such a short book some aspects of child development are omitted or only slightly touched upon. However, since the book is intended to cover only the period of infancy, no serious omissions are present. It would have been helpful to have more suggestions regarding preventive orthopedic meas-

ures. Topics that are particularly well covered are those of breast feeding, management of eating, vitamins, advice on clothing, and discussions on communicable diseases, including diarrhea. This book should be of value not only to parents but to physicians who are beginning the practice of pediatrics. One very sound suggestion to physicians is that the author indicates that he makes home visits to the baby until the infant is four months of age.

This book is an example of the leadership of practising pediatricians and their contribution to public health. Because it contains fairly specific advice on the application of new scientific developments, it is hoped that it will be revised at frequent intervals.

MARTHA L. CLIFFORD

Marriages Are Not Made in Heaven—*By Janet Fowler Nelson, Ph.D., in collaboration with Margaret Heller. New York: The Woman's Press*, 1947. (rev. ed.) 158 pp. Price, $1.75.

To those individuals who believe with the author that "marriage is not a job of work, but a way of life" this little volume will be welcome. Although the book was prepared as a discussion outline for small groups of women who want further education on marriage, it contains much of interest for parents and young girls.

The author has skillfully combined the social and personal approaches to marriage, supplying material from the field of sociology, psychology, and economics in such chapters as "The Boy Friend and the Budget," "War between the Sexes," "Time on My Hands," "Speaking of Sex," and many others equally interest provoking and rich in content.

Material presented includes suggested methods for developing discussion and resource questions for participants. References are sound. Educators and parents will find this of great help in their everyday approach to teaching better family living. BERNARDINE CERVINSKI

Summary of International Vital Statistics, 1937–1944—*Prepared under the supervision of Halbert L. Dunn, M.D., Chief, National Office of Vital Statistics, U. S. Public Health Service, Washington, D. C.: U. S. Government Printing Office*, 1947. 299 pp.

This volume was compiled and published by the National Office of Vital Statistics, U. S. Public Health Service, from data obtained during the war years to meet the urgent need for international population and vital statistics information. A wealth of material is presented with full recognition of the limitations of the data. One interesting chapter is devoted to population density in 66 countries which shows England and Wales at the top of the list with 727 inhabitants per square mile (excluding the higher densities in the Straits Settlements and in Malta) with Australia at the bottom with 2.5. The United States in this table is at 45.7 and Canada, 3.2. Other interesting tables relate to the trend of selected causes of death, including the communicable diseases, as well as longevity, marriage statistics and divorce.

REGINALD M. ATWATER

How to Interpret Social Welfare—*By Helen Cody Baker and Mary Swain Routzahn. New York: The Russell Sage Foundation*, 1947. 141 pp., Price, $2.50.

Health workers in public and voluntary agencies will find this manual on methods of interpretation as applicable to their work as to the field of social work. The emphasis in this compact and meaty little book is on the "how" to interpret rather than the content of interpretation. Basic methods are presented without elaboration on the refinements or philosophy of public rela-

tions. Media commonly used by most agencies are described with explanations of how to use them directed toward staff workers and executives. The suggestions for staff discussion should prove fruitful and well worth a weekly period for a year or more. The excellent examples included should stimulate awareness of similar examples as they come along.

In the beginning of the book the authors have included a chart relating the agency to its various publics. It aptly illustrates the book's whole approach—calling attention first to the simple ways in which an agency or staff member can avoid many a blunder, and then giving helpful ideas in executing the everyday job of public relations.

MARY F. CHAMPLIN

Medical, Legal and Social Approaches to the Problems of Inebriety—*Proceedings of a Conference Sponsored Jointly by the Research Council on Problems of Alcohol and the New York Academy of Medicine, January 8, 1947, New Haven, Conn.: Quarterly Journal of Studies on Alcohol,* 1947. 60 pp. Price, single copy, $.50; 50 or more, $.35 each.

In the winter of 1947, the Research Council on Problems of Alcohol and the New York Academy of Medicine jointly sponsored a one-day conference which explored the medical, legal, and social approaches to the problems of inebriety. The proceedings have now been published in a pamphlet which brings up to date the present thinking with respect to alcoholism as a public health and medical rather than a penal problem. MARTHA LUGINBUHL

Training in Clinical Psychiatry—*Symposium—By Lawrence S. Kubie, Chairman, Molly R. Harrower, Ph.D., Ed. New York: The Josiah Macy, Jr. Foundation,* 1947. 88 pp. Price, $1.50.

Some of the most adventurous minds in the fields of psychiatry, clinical psychology and psychiatric social work were brought together to discuss the training of clinical psychologists from the pre-clinical to the postgraduate level. This book is the report of their deliberations. The outstanding educational difficulty in the field is that of training in the clinical setting and its supervision. Clinical opportunities are too few and supervisory technics are not as clear in this field as they are in the more developed one of psychiatric social work. The place of the clinical psychologist in therapy, the relation his training has to that of the physician, the proportion of stress to be given to the psychologist as an administrator and interpreter of tests, are all discussed in considerable detail and with little concern for long-standing educational prejudices regarding the separation of the various professional groups represented at the symposium. The book will prove stimulating to those interested in training, both inservice and resident.

PAUL V. LEMKAU

Handbook of Communicable Diseases — *By Franklin H. Top and Collaborators. (2nd ed.) St. Louis: Mosby,* 1947. 992 pp. 95 illus. Price, $8.50.

This second edition of a well known and widely used book has been expanded considerably, not in terms of appreciably more space for each disease but in terms of new chapters pertaining to diseases not covered in the previous edition and in contributions of nine new collaborators. It is still elementary, because of the necessarily brief space allotted for each disease, rather than advanced in its treatment of the subject. The new volume displays evidence of having been brought up to date as well as can be judged: (1) by spot checking on such subjects as influenza, German measles, poliomyelitis, and others; and, (2) from the references at the end of

each chapter. These indices are qualitative rather than quantitative, yet some idea may be gained from the following: The present volume is enriched by approximately a thousand new references, nearly two hundred of which refer to the twelve newly included subjects. The remaining eight hundred refer, by and large, to new material. Emphasis has varied from 98 new references for poliomyelitis and 47 for influenza to only 6 new ones for tuberculosis, and this in the face of increasing interest in BCG prophylaxis and streptomycin therapy. In the chapter on Specific Prevention of Certain Communicable Diseases, no comment was made concerning BCG.

There is no appreciable change in the arrangement and presentation of the material—after a very brief general summary of infection, immunity, epidemiology, regulations, specific prevention, serum reactions, and home and hospital management there follows, classified according to portal of entry, an orderly presentation of a number of parasitic diseases, including some helminth, protozoan, fungus, bacterial, spirochetal, virus and rickettsial diseases. The number of illustrations, both color and half tone, has been increased.

For those who found the first edition useful, this reviewer strongly recommends this new, larger and more comprehensive edition; for those who are not familiar with the book, it is recommended as a convenient and excellent digest. The index is adequate for the purposes for which the book is intended.

E. GURNEY CLARK

Practical Clinical Psychiatry—*—By Edward A. Strecker, Sc.D., M.D., Franklin G. Ebaugh, M.D., and Jack R. Ewalt, M.D. (6th ed.) Philadelphia: Blakiston,* 1947. 476 pp. Price, $5.00.

This is the sixth edition of a widely used standard textbook of psychiatry. The book has been brought up to date in the light of advances made in the field since the last edition in 1940. While the theoretical approach is in general eclectic, the predominant point of view of the authors is that of the school of psychobiology of Adolph Meyer, to whom the volume is dedicated.

In the section on classification, three types of classification are given, the genetic-dynamic classification of Adolph Meyer, the standard classification of the American Psychiatric Association, and the newer classification of the Army Medical Department. While the authors indicate that the army classification represents a step forward, the sections of the textbook are organized on the classification of reaction types used in previous editions. These are: Organic reaction types, delirious reaction types, paranoid reaction types, affective reaction types, schizophrenic reaction types, primary constitutional reaction types, and the psychoneurotic reaction types. Under each of the above headings, the authors describe the various psychiatric syndromes and provide ample illustrations with case abstracts. The discussion of treatment is brought up to date. Each section has an extensive bibliography appended relating to the subject matter of the particular section. The volume is concluded with a section on the psychopathologic problems of childhood by Leo Kanner of Johns Hopkins University.

JAMES M. CUNNINGHAM

Diabetes and the Diabetic in the Community—*By Mary E. Tangney, Philadelphia: Saunders,* 1947. 259 pp. Price, $2.75.

Since the survey of Oxford, Mass., by members of the U. S. Public Health Service indicated that the undiscovered diabetics of the United States added to those already under treatment may bring the total to 2,000,000 or more, a new concept of the magnitude and needs of the diabetes problem in our population has been presented.

The discovery of diabetes before the

onset of serious symptoms affords the best opportunity for early treatment and prolongation of life. The number of patients involved will tax the medical and nursing professions and require new and wholesale methods of teaching patients, as well as medical students and nurses. This new text of Miss Tangney is intended to satisfy the objectives outlined in the section on diabetes in the *Public Health Nursing Curriculum Guide* of 1942 as prepared by a joint committee of the National Organization for Public Health Nursing and the U. S. Public Health Service.

The book has many desirable features which deserve emphasis. First, the author possesses an intimate knowledge of the personal problems of diabetics, having known diabetes as a patient since childhood, and has had long experience with large groups of diabetic patients, first at the New England Deaconess Hospital in Boston and during later years as a nurse instructor for diabetic patients at the Hartford Hospital in Hartford, Conn. She stresses the teaching of diabetic patients who live in the community rather than nursing of patients confined to the hospital. The contents of the book are planned to present new aspects of the diabetes problem arising in the increasing prevalence of diabetes in the country, which is due in large measure to the advancing age and increasing duration of life of American citizens.

What is known about the etiology and prevention of diabetes is given with references to the authorities. The strictly medical data regarding the production of insulin in the body, glycosuria and blood sugar, testing the urine, administration of the insulin daily by patients, and the diabetic diet are well presented. Separate chapters are devoted to the important complications of diabetes, including diabetic coma, arteriosclerosis and its clinical features, neuritis, nephritis, diabetes in childhood and adolescence, and particularly the problem of pregnancy in the diabetic mother. The newer data indicating that 25 per cent of the American population may be carriers of the diabetic tendency and the increasing preponderance of females among diabetics, particularly in later years, invite further investigation.

References to the literature are freely given. It is possible that the conclusion of certain authors that certain diabetics live as long as non-diabetics is not based on sufficient data, since the authors simply noted that the average age of patients studied at autopsy was about the same as that of non-diabetics. In this instance the effect of the duration of diabetes upon life expectancy did not seem to be sufficiently considered. The influence of genetic factors in diabetes is well presented in contrast to the secondary factors, such as obesity, infection, pancreatitis, and hemochromatosis.

Most useful are the chapters on diet, the teaching of diet, and the use of urine tests in relation to insulin dosage. Detailed treatment with hormones for pregnancy in diabetic mothers is given. Stilbestrol and progestin are advised on the authority of Dr. Priscilla White by intramuscular injection in small doses up to the 20th week and in larger doses during the succeeding weeks. This treatment is receiving further trial. The book is well printed and the few typographical errors hardly need be mentioned. It will help the student and graduate nurse immeasurably. The volume represents a heroic effort under great handicaps.

HOWARD F. ROOT

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Evils of Bed-Rest Overdosing—We Americans invented the deadly term "Early Ambulation." Glance at the title of this British doctor's dissertation (in small type below). That should be enough to make you promise yourself to read "The Art of Plain Talk" all over again.

ASHER, R. A. J. The Dangers of Going to Bed. Brit. M. J. 4536:967 (Dec. 13), 1947.

We're Glad This Is Settled—This comes under the head of idle curiosity for all but bacteriologists. It seems a researcher proposed that the flagella of bacteria are not organs of locomotion, just artifacts. (It never occurred to me, in my abysmal innocence, that anyone would question such an "obvious" phenomenon.) Well, these writers took another look at some flagellated bugs in an electron microscope and concluded that the tails have the significance you, too, always thought they had.

CONN, H. J., and ELROD, R. P. Concerning Flagellation and Motility. J. Bact. 54, 6:681 (Dec.), 1947.

"The Day of Dull Reading Must Pass"—Here is another paper on how to prepare and read a scientific paper, but there have been so many similar treatises written without measurable effect on our annual meetings that I doubt if it's worth while to call this one to your attention, Mr. Speaker-to-be.

FELTON, J. S. The Physician and His Public Speaking. Indus. Med. 16, 12:569 (Dec.), 1947.

Present Status of Dental Care—From among a half-dozen findings of a study of children's teeth in several Georgia communities, this one stands out most uncomfortably in my memory: there is evidence that dental caries in permanent teeth may be increasing.

HAGAN, T. L. Dental Caries Prevalence and Tooth Mortality—A Study of 24,092 Georgia Children in Twelve Communities. Pub. Health Rep. 62, 51 (Dec. 19), 1947.

Two Conditions Determine Outcome—Under exceptionally favorable circumstances about a thousand "well" children were given health examinations in the presence of the mother, and every reasonable effort was made to have needed medical care given to defects discovered. Half the children who should have had remedial care didn't get it. You simply must read this discussion of the reasons for the failure—if you don't, you're as hopeless as the neglectful mothers.

HARDY, M. C. Follow-up of Medical Recommendations. J.A.M.A. 136, 1:20 (Jan. 3), 1948.

The Prospect Is Promising—After ten years, Dr. Parran's nine basic principles for the public health control of syphilis are reviewed in the light of the progress made during the intervening decade. More than ever before, control is recognized as a medical problem to be solved by wider application of efficient case finding and medical measures.

HELLER, J. R. JR. Venereal Disease Control During the Post-War Period. J. Ven. Dis. Inform. 28, 11:245 (Nov.), 1947.

Keeping the Record Straight—You'll want to know about the Fulbright-Taft "Health, Education and Security Department" Bill, and what it might do if enacted into law.

HIRSCHFELD, G., and WOOD, E. M. A cabinet

Department of Health, Education and Security. J.A.M.A. 136, 2:113 (Jan. 10), 1948.

We Need To Know—If you agree that intellectual humility is a characteristic to be fostered, then you'll want opportunities to match your innocence against the depths of understanding of the experts. This paper reviews some of the things we need to find out before we can get much further along in cancer control.

IVY, A. C. Biology of Cancer. Science. 106, 2759:455 (Nov. 14), 1947.

Premie Salvage—You are hereby reminded that premature births are a leading cause of all deaths, and the first cause of infant mortality. There is also something to be done about it. In a second paper five doctors say that caudal analgesia cuts in half the neonatal mortality among premies.

KOCH, L. A., *et al.* Reduction of Mortality from Premature Birth, (and) HINGSON, R. A., *et al.* Newborn Mortality and Morbidity with Continuous Caudal Analgesia. J.A.M.A. 136, 4:217 (Jan. 24), 1948.

Mid-Victorian Public Health—Although a little late in the day, your attention is directed to a paper of real historic usefulness—the last of three lectures on public health in England. In social reforms we have usually tagged along, a generation or so behind that country, so you'll find in this record the genesis of some of the "pioneering" we have done. If you ever become historically minded, you will want to review this paper.

MAC NALTY, A. S. The History of State Medicine in England. J. Roy. Inst. Pub. Health & Hyg. 11, 1:9 (Jan.), 1948.

Promoting Better Nutrition—Judging nutritional adequacy is a complex job involving getting a dependable record, interpreting that record, and noting frank or subtle signs of malnutrition. My layman's guess is that this is a pretty good paper for you to read.

MC LAUGHLIN, M. A Nutritional Appraisal Program. Pub. Health Nurs. 40, 1:15 (Jan.), 1948.

Help for an Old Difficulty—Observable differences in the morphology of the viruses of smallpox, vaccinia, and chickenpox visible in the electron microscope suggest that this new instrument may prove a useful tool in differential diagnoses.

NAGLER, F. P. O., and RAKE, G. The Use of the Electron Microscope in Diagnosis of Variola, Vaccinia, and Varicella. J. Bact. 55, 1:45 (Jan.), 1948.

Paper of the Month—Quote. Public health officials will probably take exception to some of the ideas set forth . . . Unquote. If you don't find pleasure mixed with your exceptions when you read this wide-ranging epidemiologic discussion, then you just don't respond to nice writing. This is really a "must" for you, whatever your job may be.

RIVERS, T. M. Certain Public Health Aspects of Infectious Diseases. New England J. Med. 238, 2:37 (Jan. 8), 1948.

They Seem Convinced—BCG Vaccination is a safe and effective procedure for all age groups. By the use of the multiple puncture method complications are avoided. Tuberculin conversion reaction was rapid and universal. There's a lot more beside these three quotes that you should read.

ROSENTHAL, S. R., *et al.* BCG Vaccination in All Age Groups. J.A.M.A. 136, 2:73 (Jan 10), 1948.

Out of the Mouths Department—Ways to induce people to accept guidance, is too large a subject to be covered adequately in four pages, but it is one you need to think about frequently. So here is one quotation from this brief paper, jotted down in the hope that it will inspire you to dig deeper. "I

think the reason why children don't like to follow health rules is that they take too much time and limit their fun."

STRANG, R. Motivation in Health Education. Pub. Health Nurs. 40, 1:11 (Jan.), 1948.

To Assuage Public Resentment—Almost too enthusiastic to permit of being swallowed without a tiny grain of salt is this account of the medical society's effort to "Make Colorado FIRST in Health." If the program succeeds it will indubitably earn the capitals.

SWART, C. M. Revolutionary Doctors. Survey Midmonthly 83, 12:331 (Dec.), 1947.

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ADVANCES IN MILITARY MEDICINE (Two Vols.) E. C. Andrus, D. W. Bronk, G. A. Carden, Jr., C. S. Keefer, J. S. Lockwood, J. T. Wearn, and M. C. Winternitz. Boston: Little, Brown & Co., 1948. 900 pp. Price, $12.50 a set.

BEST'S SAFETY DIRECTORY OF 1948 (2nd Annual Ed.) Harry Armand, Editor. New York: Alfred M. Best, 1947. 494 pp. Price, $5.00

BIOLOGY OF MELANOMAS. Special Publications No. IV. Roy Waldo Miner, Editor, Myron Gordon, Consulting Editor, Lothar Salin, Associate Editor. New York: New York Academy of Sciences, 1948. 466 pp. Price, $5.00.

COMMUNICABLE DISEASE CONTROL (2nd ed.) Gaylord W. Anderson, M.D., and Margaret G. Arnstein, R.N. New York: Macmillan, 1948. 450 pp. Price, $5.00.

EXPERIMENTAL DESIGNS IN SOCIOLOGICAL RESEARCH. F. Stuart Chapin. New York: Harper, 1947. 206 pp. Price, $3.00.

A HISTORY OF MEDICINE. Douglas Guthrie, M.D. Philadelphia: Lippincott, 1946. 448 pp. Price, $6.00.

THE INDUSTRIAL ENVIRONMENT AND ITS CONTROL. J. M. Dallavalle. New York: Pitman Publishing, 225 pp. Price, $4.50.

LEGAL ASPECTS OF MILK SANITATION. James A. Tobey, Dr. P.H. (2nd ed.). New York: Milk Industry Foundation, 1947. 133 pp. Price, $5.00.

MEDICINE TODAY. THE MARCH OF MEDICINE, 1946. Number XI of the New York Academy of Medicine Lectures to the Laity. New York: Columbia University Press, 1947. 177 pp. Price, $2.00.

MENTAL DEFICIENCY. A. F. Tredgold, M.D. (7th ed.). Baltimore: Williams & Wilkins, 1947. 534 pp. Price, $8.50.

MOLECULES AGAINST MICROBES. E. S. Duthie. London, Eng: Sigma Books, Ltd., 1947. 156 pp. Price, 6s.

MONOGRAPHS ON THE PROGRESS OF RESEARCH IN HOLLAND. Chemical and Physical Investigations on Dairy Products. H. Elers, R.N. J. Sall, M. van der Waarden. New York: Elsevier Publishing, 1947. 215 pp. Price, $4.00.

NEW APPROACH TO NUTRITION SERVICES IN STATE HEALTH DEPARTMENTS. Papers Presented at the Round Table of Nutrition and Public Health, 1946 Conference. New York: Milbank Memorial Fund, 1947. 108 pp. Price, $.75.

OCCUPATIONAL MEDICINE AND INDUSTRIAL HYGIENE. Rutherford T. Johnston, A.B., M.D., St. Louis: Mosby, 1947. 604 pp. 117 illus. Price, $10.00.

PATHOLOGY OF NUTRITIONAL DISEASE. Richard H. Follis, Jr., M.D.. Springfield, Ill: Thomas, 1947. 291 pp. Price, $6.75.

PLANNING YOUR FAMILY. Public Affairs Pamphlet No. 136. Herbert Yahraes. New York: Public Affairs Committee, 1948. 32 pp. Price, $.20.

PRACTICAL FOOD INSPECTION (3rd ed.) In Two Volumes. Volume I—Meat Inspection. C. R. A. Martin. London, Eng: H. K. Lewis & Co., 1947. 316 pp. Price, 18s.

RADIO MANUAL. A GUIDE TO BROADCASTING FOR MOUTH HEALTH EDUCATION. New York: Oral Hygiene Committee for Greater New York, 1947. 320 pp. Price, $4.00.

RODDY THE RAT. George S. Bote and Dorothy C. Stephens. Gainesville, Fla.: University of Florida, 1946. 68 pp. Price, $.15.

SAY IT WITH FIGURES. Hans Zeisel. New York: Harper, 1947. 250 pp. Price, $3.00.

SOME NOTES ON THE PSYCHOLOGY OF PIERRE JANET. Elton Mayo. Cambridge, Mass:

Harvard University Press, 1948. 132 pp. Price, $2.50.

STATISTICAL ABSTRACT OF THE UNITED STATES 1947. Compiled under the Supervision of Morris H. Hansen. Washington: Supt. of Documents. Gov. Ptg. Office, 1947. 1038 pp. Price, $2.75.

STUDIES ON SCHISTOSOMIASIS. National Institute of Health Bulletin No. 189. Washington: Gov. Ptg. Office, 1947. 212 pp. Price, $.50.

SULFONAMIDES AND ALLIED COMPOUNDS. Elmore H. Northery, Ph.D. New York: Reinhold Publishing Corp., 1948. 660 pp. Price, $12.50.

TEXTBOOK OF BACTERIOLOGY. R. W. Fairbrother, M.D. (5th ed.). New York: Grune & Stratton, 1948. 480 pp. Price, $6.00.

TUBERCULOSIS. Francis Marion Pottenger, A.M., M.D. St. Louis: Mosby, 1948. 598 pp. 105 illus. Price, $12.00.

TUBERCULOSIS NURSING MANUAL. Robert H. Riley, M.D., Director. Maryland: Maryland State Department of Health. 40 pp.

YOUTH IN DESPAIR. Ralph S. Banay. New York: Coward-McCann, 1948. 239 pp. Price, $3.00.

THE FOLLOWING REPORTS HAVE BEEN RECEIVED

ANNUAL REPORT OF THE BOARD OF HEALTH, TERRITORY OF HAWAII, 1947. C. L. Wilbar, Jr., M.D., President. 149 pp.

ANNUAL REPORT OF THE COMMONWEALTH FUND (29th.). 1947. New York: The Commonwealth Fund, 1948. 63 pp.

BOSTON HEALTH LEAGUE 1941–1947. Boston (261 Franklin Street), 1947. 11 pp.

CITY OF BALTIMORE. 132nd Annual Report of the Department of Health, 1946. 366 pp.

A DECADE OF DOING—1938–1948. New York: National Foundation for Infantile Paralysis.

HEALTH OF THE SCHOOL CHILD. Report of the Chief Medical Officer of the Ministry of Education for the Years 1939–45. London: His Majesty's Stationery Office, 1947. 148 pp. 2s.6d.

NEW BRUNSWICK DEPARTMENT OF HEALTH. 28th ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER FOR YEAR ENDING OCTOBER 31, 1945 AND 29th ANNUAL REPORT FOR THE YEAR ENDING OCTOBER 31, 1946. Canada: New Brunswick Department of Health. 116 pp. each.

OPERATION AND MANAGEMENT OF MILK PLANTS. Circular No. 260. Washington: Department of Agriculture, 1947. 58 pp.

PUBLIC HEALTH IN MARYLAND 1946. Report of the Director. Baltimore: Maryland State Board of Health, 1947. 36 pp.

REPORT OF THE COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER FOR THE YEAR 1946. Sir Allen Daley, M.D. London, Eng: Staples Press, 1947. 86 pp. Price, 2s.0d.

RESULTS OF TREATING BOVINE MASTITIS WITH SULFONAMIDES CONTAINING UREA. Technical Bulletin No. 946. Washington: Department of Agriculture, 1947. 17 pp.

THIRTY-FOURTH ANNUAL REPORT, 1946. Civil Service Commission, City of Detroit, Mich. 67 pp.

ASSOCIATION NEWS

76TH ANNUAL MEETING

BOSTON, MASS., NOVEMBER 8–12, 1948

Members of the Association are already asking about hotel rooms in Boston. On or about April 1, a hotel reservation application form will be mailed to every member and the Housing Bureau in Boston will operate on and after that date. The *Journal* will also quote hotel rates beginning with the April number.

FELLOWSHIP IN THE AMERICAN PUBLIC HEALTH ASSOCIATION

The grade of Fellowship was established in the American Public Health Association in 1922. Professional workers in public health are eligible for election as Fellows under certain conditions and as an indication that they have achieved a recognized professional standing. As of January 1, 1948, the total membership of the Association was 11,124, including 1,913 Fellows, or 17 per cent of the total.

Questions are frequently asked regarding the requirements for Fellowship and the following statement outlines the provisions of the By-laws governing qualification and election.

Persons who have been members of the Association for at least two years and who have reached their 30th birthday are eligible to apply if, in their opinion, they meet the conditions of one or more of the six clauses in the By-laws defining "an established professional standing." These six possible approaches are as follows:

a. A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine with at least one year of graduate study in public health in a University, Master of Public Health, Diploma in Public Health, or other equivalent degrees, according to standards approved by the Executive Board of the American Public Health Association.

b. A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

c. A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

d. A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

e. A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs "b" and "d" that the applicant may have had shall be considered the equivalent of the same number of years' experience as a "teacher."

f. A person not covered by the above, who has made substantial contributions to public health work in his chosen branch, who has attained a recognized professional standing.

Persons wishing to apply should request a Fellowship application blank from the American Public Health Association Membership Department, 1790 Broadway, New York 19, N. Y. Appli-

cations are accepted up to August 1 each year for consideration by the Governing Council at the fall meeting. It is important to make clear that members themselves should take the initiative in submitting such applications. Neither the Sections nor the A.P.H.A. administrative staff are authorized to solicit applications. This means that, although nearly 3,000 persons have been duly recognized with this grade of affiliation since 1922, there are other persons well qualified who have never initiated the process of applying for Fellowship. It should be clear that members should not await action by others if they wish to attain Fellowship. It is necessary and proper for them to take the first step.

An application for Fellowship requires sponsorship by two Fellows of the Section with which the applicant desires to be affiliated. These personal signatures are to be obtained by the applicant before submitting the completed application. The A.P.H.A. office will assist, on request, in determining the Section with which prospective sponsors are affiliated. Applications from persons not wishing to be identified with a particular Section and requesting unaffiliated Fellowship may be sponsored by any two Fellows of the Association.

When properly sponsored and otherwise completed, the application is sent to the A.P.H.A. office, after which the list of persons applying is published in the *American Journal of Public Health*, usually in the September issue, but in any case not less than 15 days before the date for the Annual Meeting. An established routine is followed for review by the Section Councils (unaffiliated applications are reviewed by the Executive Board) and by the Committee on Eligibility. This Standing Committee of the Association is made up of one Fellow from each of the 12 Sections, plus a Chairman elected by the Executive Board. This group is under instructions from the Governing Council to examine each application in accordance with the provisions of the clause of the By-laws chosen by the applicant, and to apply the criteria with precision in each case. Final election is by the Governing Council at the second meeting at each annual session.

The privileges of Fellowship include eligibility to serve as an officer of the Association or one of the Sections, Chairman of an Association or Section Committee (over one hundred in number), a member of one of the four Standing Committees, a member of the Governing Council or Executive Board, and the right to vote at the Annual Meeting for the elective members of the Governing Council and on amendments to the Constitution. Some Civil Service and merit system records depends upon Fellowship in the American Public Health Association as an achievement deserving recognition in applicants.

The dues of Fellows are $12.00 annually, and include a subscription to the *American Journal of Public Health* and other services to which members are eligible. Life Membership is available at $200, covering all future annual dues.

Applications for Fellowship to be considered at the 76th Annual Meeting in Boston, Mass., November 9–12, 1948, should be filed with the Association as soon as they are completed, and in any case not later than August 1. For further information address the Membership Department, American Public Health Association.

A.P.H.A. membership application blank on page XXIX

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Adam N. Beattie, M. D., D.P.H., 451 Strathcona Ave., Kelowna, B.C., Canada, Director, Okanagan Valley Health Unit

Herbert G. Cull, M.D., 2010 McClelland, Houston, Tex., Physician, Houston Health Dept.

Matthew Dantow, M.B., D.P.H., Health Region No. 13, North Battleford, Sask., Canada, Regional Medical Health Officer

Allan J. Fox, Town Hall, Main St., Greenfield, Mass., Agent, Board of Health

Stillman J. Hathaway, M.D., Health Department, Court House, Chehalis, Wash., Health Officer, Lewis-Pacific District Health Dept.

Alan D. Houser, M.D., New Paltz, N. Y., Apprentice Epidemiologist, State Health Dept.

Edward X. Link, M.D., 213-15 So. 17th, Mattoon, Ill., Health Commissioner

Archibald F. Mackay, M.B., D.P.H., 65 Simcoe Street, South, Oshawa, Ont., Canada, Medical Officer of Health

Hon. Paul Martin, LL.D., House of Commons, Ottawa, Ont., Canada, Minister of National Health and Welfare

Samuel Minowitz, M.D., M.P.H., 1 St. Pauls Court, Brooklyn 26, N. Y. District Health Officer, City Health Dept.

Harriet N. Rogers, M.D., M.A., Box 106, Lucedale, Miss., Director, Southeastern Health District

Silas C. Rutland, M.D., West Central Region, State Health Dept., Griffin, Ga., Medical Director

Edward M. Thompson, M.D., M.P.H., 212 North Upper St., Lexington, Ky., Health Officer and Director of Field Training, Lexington-Fayette County Health Dept.

Laboratory Section

Lawrence D. Blitzer, Y.M.C.A., 215 W. 23rd St., New York, N. Y., Bacteriologist, Synochem Corporation

Horace A. Kelley, Apartado 16, Montemorelos, N. L., Mexico, Laboratory Technician, Montemorelos Hospital and Sanatorium

William H. Mair, 101 Central Avenue, Westfield, N. J., Director, Clinipath Laboratories

Clara V. McWhirk, Fitzgibbon Memorial Hospital, Marshall, Mo., Director of Laboratories

Virginia L. Pipe, 5660 Kingsbury, St. Louis 12, Mo., Senior Assistant Bacteriologist, St. Louis Public Health Laboratory

Bill J. Reed, Municipal Laboratory, Mason City, Iowa, Laboratory Technician

Zana G. Skidmore, M.S., Oklahoma A & M College, Stillwater, Okla., Asst. Professor of Bacteriology

Marie S. Slawson, 2135 N. E. 45th, Portland 13, Ore., Bacteriologist and Parasitologist, Emma M. Howe Medical Laboratory

Benjamin Q. Ward, M.A., 110 Montgomery, Laramie, Wyo., Asst. Bacteriologist, Univ. of Wyoming

Ruth Winchell, M.A., Rt. 1, Box 1755, Portland 6, Ore., Chemist, Emma M. Howe Medical Laboratory

Vital Statistics Section

Dorothy H. Johnston, 1085-43rd St., Oakland, Calif., Senior Public Health Analyst, State Department of Public Health

Mrs. Wilson B. Purser, 219 Millsaps Ave., Jackson, Miss., Secy., Vital Statistics Division, State Board of Health

Edgar G. Titus, Sc.D., 128 State Capitol, Salt Lake City, Utah, Director, Division of Vital Statistics, State Department of Health

Engineering Section

Charles R. Barden, M.S., 1414 Lavaca, Austin, Tex., Public Health Engineer, Texas Public Health Training Unit

Paul Bierstein, World Health Organization, P.O. Box 1477, Addis Ababa, Ethiopia, Sanitary Engineer

John Kaminski, Sears, Roebuck & Co., Dept. 817, 925 S. Homan Ave., Chicago 7, Ill., Merchandise Testing and Development Laboratory

Samuel C. Olmstead, City Hall, Moberly, Mo., Sanitation Inspector, Health Dept.

Jacob Samarjian, 631 Bay St., Santa Monica, Calif., Sanitarian, Los Angeles County Health Dept.

Millard E. Smith, C.E., I.I.A.A. c/o American Embassy, Lima, Peru, S. A., Chief Engineer and Associate Chief, Field Party, Institute of Inter-American Affairs

Leon W. Weinberger, S.M., Graduate House, Mass., Inst. of Tech., Cambridge 39, Mass., Research Asst.

George E. Welty, Ph.G., 1251 So. Bronson, Los Angeles 6, Calif., Principal Sanitarian, City Health Dept.

Food and Nutrition Section

Helen M. Amos, 515 South 31st St., Omaha 5, Nebr., Student, Univ. of Michigan School of Public Health

Dorothy M. Kiely, M.S., 406 Orange St., Wilmington, N. C., Nutrition Consultant, State Board of Health

Ahbrohm X. Rossien, M.D., 8415 Beverly Road, Kew Gardens 15, N. Y., Consultant Gastroenterologist

Malcolm R. Stephens, 1211 New Post Office Bldg., Chicago, Ill., Chief, Chicago Station, U. S. Food and Drug Administration

Maternal and Child Health Section

Hedvig H. Holzer, M.D., 591 Morton St., Dorchester 24, Mass., Child Welfare Physician, State Dept. of Public Health

Lula J. McNeil, Route 3, Box 455-A, Norfolk, Va., Public Health Nurse, State Dept. of Health

Bertrand Primeau, M.D., 227 Aspinwall Ave., Brookline 46, Mass., Student, Harvard School of Public Health

Public Health Education Section

Catherine Beermann, R.N., B.S., 77 Wheeler Ave., Westwood, N. J., Director, Northern Bergen Nursing Service

Douglass R. Hayes, 1376 N. Kenmore St., Arlington, Va., Chief of Graphics, U. S. Public Health Service

Sol. Levy, M.D., Eastern State Hospital, Medical Lake, Wash., Clinical Director

Earle G. Lippincott, M.A., Russell Sage Foundation, 130 E. 22 St., New York 10, N. Y., Research Associate

F. Mack Moore, P. O. Box 76, Cathedral City, Calif., Deputy Health Officer, Riverside County Health Dept.

Amalia Rivera, Direccion General de Sanidad, San Salvador, El Salvador, C. A., Asst. Health Educator, Division of Health Education

Max Whitman, M.A., 51–63 Stuyvesant Place, Staten Island 1, N. Y., Health Education Asst., New York City Health Dept.

Dora H. Young, M.A., State Capitol, Helena, Mont., Secretary, State Narcotics Education Commission

Public Health Nursing Section

Frances M. Avery, R.N., 510 E. Kilbourn Ave., Milwaukee 2, Wis. Instructor, Marquette University College of Nursing

Eva K. Belflower, R.F.D. No. 2, Tifton, Ga., Emergency Nurse, State Dept. of Public Health

Agnes C. Cooley, 5307–64th St., Maspeth, N. Y., Student, New York Univ.

Christie T. Corbett, 12 Fordonia Bldg., Reno, Nev., Director, Division of Public Health Nursing, State Dept. of Health

Elizabeth G. Eckert, Neighborhood League, 119 W. Wayne Ave., Wayne, Pa., Supervisor of Nurses

Elaine Goben, R.N., M.S., 1221 Sherman St., Denver, Colo., Advisory Nurse, Division of Crippled Children, State Dept. of Health

Charlotte Hasselbusch, 637 Ingraham St., N.W., Washington 11, D. C., Educational Director, Instructive Visiting Nurse Society

Virginia M. Lloyd, R.N., 701 London St., Portsmouth, Va., Public Health Nurse, State Health Dept.

Ruth G. McDonald, R.N., B.S., Apt. C, 2011 Flower, Bakersfield, Calif., Supervising Nurse, Kern County Health Dept.

Anne R. Ohlbaum, 780 Grand Concourse, New York, N. Y., Director, Eastchester Public Health Nursing Assn., Tuckahoe, N. Y.

Ione L. Ripley, American Embassy, Lima, Peru, Chief Nurse, Office of Inter-American Affairs

Kathryn A. Robeson, M.A., 1949 McGraw Ave., New York, N. Y., Administrative Asst. and Consultant, Visiting Nurse Service of New York.

Frances E. Shelley, R.N., B.S., 810 Chalfonte Drive, Alexandria, Va., Public Health Nursing Consultant, U. S. Public Health Service

Helen R. Swedburg, R.N., B.S., 824 Harris Ave., Woonsocket, R. I., Director, Woonsocket Public Health Nursing Assn.

Louise B. Thomson, 207 Shepard St., Chevy Chase, Md., Supervisor, Instructive Visiting Nurse Society

Epidemiology Section

Domingos Barbosa-Carvalhedo, M.D., M.P.H., Caixa Postal No. 47, Manaus, Amazonas, Brazil, Health Officer, Special Service of Public Health

Sidney B. Clark, M.D., M.P.H., 1302–32nd Ave., San Francisco, Calif., Medical Officer, Acute Communicable Disease Service, State Dept. of Public Health

Mary K. Dunlap, D.V.M., 2316 Ward St., Berkeley, Calif., Veterinarian

John S. Hathaway, M.D., 109 College, New Haven, Conn., Asst. Director, Yale Dept. of Health

Mildred A. Morehead, M.D., 44 Allandale St., Jamaica Plain, Boston, Mass., Student, Harvard School of Public Health

Norman Plummer, M.D., 140 West St., New York 7, N. Y., Medical Director, New York Telephone Co.

Julius S. Prince, M.D., Wildcliff Road, New Rochelle, N. Y., Physician-in-Training, State Dept. of Health

School Health Section

Elsie F. Johnson, R.N., 1315 Seventh Ave., Worthington, Minn., School Nurse, Worthington Public Schools

Leo C. Kaye, Ed.M., 511 Sound Ave., Riverhead, N. Y., Camp Sanitary Aide, State Dept. of Health

Annie R. Moore, M.P.H., School Health Coordinating Service, P. O. Box 2091, Raleigh, N. C., Health Educator

Louis L. Shapiro, M.D., M.P.A., 135 Central Park West, New York 23, N. Y., School Medical Inspector, Board of Education

Helen A. Sharkey, 2102 Aqeduct Ave., New York 53, N. Y., Student, New York Univ.

Dental Health Section

Betty Krippene, D.H., State Board of Health, Dist. No. 3, Court House, Fond du Lac, Wis., District Dental Hygienist

Julius M. Miller, D.D.S., 250 East 58th St., New York 22, N. Y., Acting Chief Oral Surgeon, Stuyvesant Polyclinic Hospital

Milton E. Nicholson, D.D.S., 609 Shields Bldg., Pittsburgh 21, Pa., Lecturer in Public Health Dentistry, Univ. of Pittsburgh School of Dentistry

Charles E. Presnell, D.D.S., M.S.P.H., State Division of Health, Jefferson City, Mo., Director of Public Health Dentistry

Unaffiliated

Helen Feild, 1212 Broadway, New Orleans 18, La., Secy., Health Division, Council of Social Agencies

Hugh R. Jackson, M.S., 311 South Juniper St., Philadelphia 7, Pa., Exec. Director, Public Charities Assoc., of Pennsylvania

John A. Rowe, Ph.D., 4215 East 67th St., Kansas City, Mo., Consultant, Communicable Disease Center, U. S. Public Health Service

Frank Stevens, Tremonton, Utah, Principal, Bear River High School

DECEASED MEMBERS

Karl R. Bailey, M.D., Boston, Mass., Elected Member 1946, Laboratory Section.

Elizabeth C. Brown, Columbia, Mo., Elected Member 1938, Elected Fellow 1942, Laboratory Section.

Frank T. Powers, Glen Cove, N. Y., Elected Member 1934, Unaffiliated.

EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

(Supplemental to list in February Journal)

Positions Available

Health Officer in one of the most desirable locations in Montana; population 30,000; salary $6,000 to $7,000, depending upon training and experience. Write **Box A-1.** Employment Service. A.P.H.A.

Executive Director for community health agency in suburban Philadelphia. Professional staff of twelve nurses and dentist. Generalized nursing service affiliated with local Boards of Health and Schools; Dental Clinic; Child Health Centers; Practical Nurse Registry. Nurse with academic degree plus supervisory and administrative experience in official and nonofficial public health nursing. Retirement plan, one month vacation, 5 day 39½ hour week, sick leave. Salary open. Write Mr. H. H. Perry, President, Community Health and Civic Association, 25 East Athens Avenue, Ardmore, Pa.

Public Health Nurse and a Physiotherapist. Metropolitan Area of Washington, D. C. Excellent working relations. Good salary. Apply to Mrs. Sarah Brooks, Director of Nursing Bureau, Arlington Health Department, 1800 N. Edison Street, Arlington, Va.

Bacteriological Technician to assist in Bacteriology Department of Research Division of large pharmaceutical and biological firm. College graduate and at least one year of experience required. Experience in immunology or chemotherapy desirable. $55 per week to start. Regular increases. Paid vacation. Five day week. Write **Box A-2,** Employment Service, A.P.H.A.

Public Health Nursing Field Supervisor; B.S. degree with major in Public Health Nursing and theory and experience in supervision required. Salary: minimum $3,000, higher depending upon qualifications. Interesting and growing program. Write: Director, Public Health Nursing Association, Des Moines, Iowa.

Qualified Bacteriologist, Serologists and Sanitarians wanted for positions in New Mexico Department of Public Health. Permanent tenure, vacations and sick leave with pay. For application blanks and information write Merit System Supervisor, Box 939, Santa Fe, N. M.

Sanitarian for metropolitan county 300,000 population to assist in generalized sanitation program. Area includes rural as well as urban sanitation problems; offers excellent opportunity for activity in all fields of environmental health. Experience in general sanitation activities required. Salary $3,315 to $3,795. Retirement plan, liberal vacation allowance, sick leave, 5 day week. Mileage allowance 7¢. Must furnish own car. Write Wayne County Health Department, Eloise, Mich.

Public Health Nurses needed in Nevada. Permanent positions in rural counties and local county health unit.

Junior Public Health Nurses: (salary range $2,160–$2,640 annually); minimum of 6 months postgraduate public health nursing training.

Senior Public Health Nurse (salary range $2,340–$2,940 annually). One academic year of postgraduate training in public health nursing plus satisfactory experience in official agency. Mileage allowance 7½¢, if nurse owns car.

Supervisory Nurse for 6–7 counties (salary range $2,580–$3,300 annually plus travel allowance). Degree plus 1 year postgraduate training in public health nursing and two years' experience. All positions subject to Merit System examination. Write: Division Public Health Nursing, Nevada State Department of Health, 12 Fordonia Building, Reno, Nevada, for full details.

Director of Health for new combined city-county Health Department in Indiana. Challenging opportunity to reorganize and increase health program of considerable scope for capable and well trained man. Salary possibly up to $10,000. Write **Box A-4.** Employment Service. A.P.H.A.

Research Microbiologist, as Chief of Division of Research and Investigations of State Health Department, N.E. Must be well grounded in bacteriology, immunology, and laboratory techniques of virus

diseases; ability to encourage research in other divisions. Salary $4,620–5,820 plus $180 cost of living increase. Annual increments of $240 based on achievement. Write **Box A-5.** Employment Service. A.P.H.A.

Public Health Commissioner in Tuscarawas County, New Philadelphia, Ohio. Must have degree in public health. To serve in a county with a population of approximately 40,000. Beginning salary $6,000 or more. Write **Box A-3.** Employment Service. A.P.H.A.

Physicians (several), experienced in medical care administration or equivalent; for Health Services Division of Welfare and Retirement Fund. Age 30-45; exception possible for otherwise well qualified applicants. Salary range $8,000–$12,000 dependent on training and experience. Write **Box A-6.** Employment Service, A.P.H.A.

City Health Officer. $6,000–7,200 plus $63.85 monthly cost of living adjustment. Practical experience in public health, graduation from medical school, Wisconsin license or eligibility. Write Personnel Division, City Hall, Madison 3, Wis.

Several vacancies **Nursing Division.** Public Health Supervisor $3,000–3,720; Senior Public Health Nurse $2,640 to 3,360; Senior Bacteriologist $2,820–3,540. Merit System. Vacation and sick leave with pay. Submit credentials and recommendations with first communication to: Floyd R. Town, M.D., Director, Bremerton and Kitsap County, Department of Public Health, Bremerton, Wash.

Bacteriologist, investigational work in pulp and paper fields involving bacteriological and mycological studies. Salary commensurate with experience and ability. Give all details in first letter. Write: The Institute of Paper Chemistry, Appleton, Wis.

National trade association requires **Department Head.** Preferably graduate sanitary engineer, experienced in state, county or city health departments. Some travel. Headquarters probably Chicago. Excellent opportunity for man with proper training and with initiative and good personality. Write fully education, experience, and references. **Box E-2.** Employment Service, A.P.H.A.

Supervising and staff **Public Health Nurses** needed in department of public health in modern agricultural county in southern California. Minimum N.O.P.H.N. qualifications required. Salary range $2,916–3,540; vacation and sick leave. Write Burke E. Schoensee, M.D., County Health Officer, El Centro, Calif.

Sanitarian with Public Health experience; B.S. degree in bacteriology or chemistry. Assist generalized environmental sanitation program in established department in east central Michigan; applicant must have car. Beginning salary $3,000 plus travel allowance. Position offers excellent opportunity for self expression and selected applicant will be one of six carrying forward the programs in this area. Write Bay City Department of Health, Bay City Hall, Bay City, Mich. State qualifications and experience.

Medical Health Officer for City of Saskatoon. Salary range $5,000–6,000. Successful applicant permitted to devote limited amount of time to lecturing at University of Saskatchewan on public health subjects. Applications giving particulars of age, qualifications, previous experience, and accompanied by copies of testimonials, are to be addressed to Andrew Leslie, City Commissioner, City Hall, Saskatoon, Saskatchewan.

Advisor to Dean of College of Medicine, Seoul National University in Korea. Qualifications: Male between ages of 28 and 55. Graduate of recognized medical college. Experience in medical education preferred. Knowledge of Korean conditions, manners, and customs is important. Korean language desirable but not required. Salary: $5,905.20 base plus 25 per cent overseas allowance, making a total annual salary of $7,381.50. Apply: Lt. Colonel Arthur W. Hodges, Jr., War Dept. Special Staff, Washington 25, D. C.

Public Health Nurse position. Generalized public health nursing. Civil Service requirements: one year of public health nursing at approved university; experience preferred. Salary range $2,400 to $2,800—$120 increase per year. Three weeks vacation, sick leave 12 days per year, accumulative. Personal car, mileage 6¢ for travel on duty. Write to Adele Didricksen, R.N., Director Public Health Nursing, Ulster County Health Department, 61 Albany Avenue, Kingston, N. Y.

Bacteriologist—$3,360. Three years' experience in clinical or laboratory diagnosis. Master's or Doctor's degree. Complete charge of Public Health laboratory, town of approximately 10,000. Apply to Bureau of Personnel, State Capital, Madison 2, Wis.

Public Health Nursing Supervisor for county unit in process of organization, degree and experience desirable. Salary $3,000 and travel. Write to: Montgomery County Health Department, Hillsboro, Ill.

California County Health Department needs **Public Health Analyst**—Salary $2,964–$3,564. **Dental Hygienist**—Salary $2,832–$3,408. Travel allowance 7¢ per mile. Civil Service and Retirement systems. Population 200,000. Write: W. A. Powell, M.D., Health Officer, Health Department, Contra Costa County, Martinez, Calif.

Staff Nurse, preferably with some public health nursing experience. Area, both urban and rural, population appr. 33,000. Generalized public health service, well-baby clinics, bedside care, school nursing, tuberculosis clinics. Five day week, month vacation, all holidays, sick leave. Salary dependent upon qualifications. Write to Red Cross Nursing Service, West Essex Chapter, 14 Park Street, Caldwell, N. J.

Health Officer and **Public Health Nurses** for rural public health program coöperating with the North Carolina State Board of Health and the University of North Carolina School of Public Health. This Health Unit serves as a field training center for Public Health personnel. The public health program operates under the State Merit System which regulates requirements and salaries. Write to O. David Garvin, M.D., District Health Officer, Chapel Hill, N. C.

Director of Health Education and **Health Services** in public school system in midwestern city of 100,000 population. Ability to develop health education program in public school system. Coordinate community resources. Direct health and safety education; medical, dental and nursing services; food services; school sanitation; physical sanitation. Salary $5,000 depending on training and experience. Write **Box A-7.** Employment Service. A.P.H.A.

Assistant Executive Secretary (health education) voluntary health agency. North Eastern city. M.P.H., and some community experience required. Man or woman. Salary $3,200–$3,600. Opportunity to develop program in suburban areas. Write **Box A-8.** Employment Service. A.P.H.A.

Public Health Opportunities in Colorado

Dentist, as Director of Public Health Dentistry Section. Salary $4,800–5,500.

Public Health Physicians:

1. Director, Local Health Services. Salary $6,750.
2. Director, Preventive Medical Services. Salary $6,750.
3. Director, Tuberculosis Control. Salary $4,800–5,500.
4. Director, Venereal Disease Control Section. Salary $4,800–5,500.
5. Director, Maternal, Child Health and Crippled Children Section. Salary $4,800–5,500.

Apply at: State Civil Service Commission
314 State Capitol
Denver, Colo.

Fellowships for the Training of Health Educators

Fellowships leading to a Master's Degree in Public Health in the field of Health Education are again being offered this year to any qualified United States citizen between the ages of 22 and 40. Funds are available through a grant from the National Foundation for Infantile Paralysis.

Candidates must hold a Bachelor's degree from a recognized college or university at the time the application is filed, and must be able to meet the entrance requirements of the accredited school of public health of their choice. Proof of acceptance at such a school must be furnished before applications are submitted to the Fellowship Awards Committee for consideration. In addition to the Bachelor's degree, courses in the biological sciences, sociology, and education are required. Training in public speaking, journalism, psychology, and work in public health or a related field is considered desirable.

The fellowship consists of 8 or 9 months' academic work, which begins with the fall term in 1948, and three months of supervised field experience in community health education activities in a local health department. The academic training includes courses in public health administration, epidemiology, public health and school education, problems in health education, community organization, information techniques, and others.

Veterans are encouraged to apply, and will be paid the difference between their subsistence allowance under the G-I Bill of Rights and the monthly stipend of $100 for single veterans or $150 for married veterans. Employees of state or local health departments are not eligible, since federal grants-in-aid are provided through the states for such training.

Information and application blanks may be obtained by writing to the National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.

Public Health Workers Needed for European Rehabilitation Program

We need two qualified public health physicians; six public health registered nurses, one chief nurse to organize programs; one health consultant capable of setting up training schools for practical nurses; two nurse educators to head these schools; three medical social workers; and two public health dentists. All personnel must enlist for eighteen months. They must have physical stamina, be adaptable and sympathetic. A knowledge of Yiddish is necessary. Interested applicants should apply to the Health Committee of Joint Distribution Committee, 270 Madison Avenue, New York 16, N. Y.

POSITIONS WANTED

Senior Serologist seeks position in southern California; 15 years' experience including 4 years as laboratory officer. Major Army United States. Write **Box L-1.** Employment Service. A.P.H.A.

Veterinarian with training in bacteriology, organic chemistry, and pathology; experience in public health work as a veterinary inspector for large Midwestern city; experience in clinical laboratory procedures: desires position in or outside United States requiring initative and diligence. Write **Box V-1.** Employment Service, A.P.H.A.

Position in School Health Education or public health education wanted by woman with many years' experience in teaching and community organization in public health. Master's degree in public health. East or Middle West preferred. Write **Box H-E-1.** Employment Service. A.P.H.A.

Biological and Physical Chemist available for research, control, teaching. Extensive experience research, industrial development and control on pharmaceuticals, biologicals, bio-assays, also expert in animal surgery. Original analytical and physical-chemical methods. Former University professor, 60 publications; many in medical research; books. Executive ability. Age 35, married, children. Seeks responsible position Hospital Laboratories or Educational Institution, New York Metropolitan area preferred. **Box L-2.** Employment Service. A.P.H.A.

Sanitary Engineer, A.B., M.S., C.E., 3 years' experience in Public Health Engineering with Federal, State, and local agencies. Army experience in water supply in the Pacific. Desires position in public health engineering. Write **Box E-1.** Employment Service. A.P.H.A.

Health Educator, B.S. in Education, New York University, M.P.H., Yale University Department of Public Health. Experienced in community organization with City Health Department; Instructor of Health Education in University. Interested in Health Education in the community or as School Health Coördinator Write **Box H-E-2.** Employment Service. A.P.H.A.

Graduate Veterinarian with undergraduate and graduate work in dairy technology, experienced in both fields, desires position as sanitarian in a public health capacity or related work; suggestions solicited. **Write Box V-2.** Employment Service. A.P.H.A.

Physician 18 years of active practice in internal medicine and chest diseases (Pneumo-thorox treatment); desires position in tuberculosis control (institutional or field) or one requiring general clinical background. Eligible for New York license; available immediately; references sent on request; age 44, married, children. Write **Box Ph-1.** Employment Service. A.P.H.A.

Industrial Hygiene Chemist, M.S.; 13 years' experience in analytical chemistry. Seven years' experience with well known industrial hygiene laboratory. Familiar with wide variety of chemical methods. Present salary above $5,000 but immediate increase in salary not as important as opportunity to advance and reasonable security. Write **Box I-H-1.** Employment Service. A.P.H.A.

Advertisement

Opportunities Available

WANTED—(a) Public health physician to direct medical program; executive ability required; advantageous if experienced in administering medical care program; salary dependent upon qualifications, ranging $8,000 $12,000; national organization. (b) Medical director; city of 100,000 located short distance from several large cities and university medical center; Middle West. (c) Student health physician to direct department, eastern university. (d) Public health officer; Korea; $6,000, traveling expenses. (e) Assistant school physician; public school system considered one of most progressive in the country; enrollment of 25,000; Middle West. (f) Public health physicians for the following directorships: (a) Local health administration; (b) Maternal and child health; (c) Tuberculosis control; headquarters in fashionable winter resort town—West. **PH3-1** Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago 11.

WANTED—(a) Sanitary engineer to direct mosquito control program; four years' professional engineering experience including work in sanitary engineering required; around $6,000: U. S. dependency. (b) Assistant director of health education; municipal health department; West. (c) Sanitary engineer; duties consist of surveying and outlining plans for sanitary facilities; water supply; mosquito and fly control; Arabia. (d) Sanitary engineer to direct department serving population of 7,000,000: experience in water and malarial control required; M.A. degree and public health background essential; South America. (e) Health educator; city health department; university medical center, Middle West; around $4,000. (f) Assistant professor of sanitary engineering; degree in sanitary or civil engineering; Master's degree advantageous; $4,000-$5,000. (g) Health educator to direct division of county community and council of social agencies; newly created position; $4,000. **PH3-2** Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago 11.

WANTED—(a) Advisory nurse for generalized program; duties consist of supervising local agencies throughout state; $3,660 $4,300. (b) Assistant supervising public health nurse; county health department; southern California; $3,000-$3,560. (c) Two public health nurses; generalized program; attractive summer resort area; $2,700 plus $700 traveling expenses; Middle West. (d) Public health supervisors and staff nurses for positions in South America; knowledge of Spanish or Portuguese desirable. (e) Public health nurse of supervisory caliber with knowledge of Spanish to supervise health center in Latin America. **PH3-3** Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago 11.

Advertisement

Opportunities Wanted

Public health physician; M.S. degree, Public Health Medicine; seven years' public health administration; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Parasitologist; two years, entomologist in the West Indies; seven years on faculty of medical school, including three as head of department of parasitology; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Dentist; twelve years, private practice during which time has served as public health dentist on part-time basis; experienced in teaching; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; Master's degree in Education (Health and Physical Education); four years, health educator, natioinal organization; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11.

Chemical engineer; B.S. in Chemical Engineering; year's graduate training in Sanitary Engineering, Harvard; seven years, communicable disease control, major part of work in malarial control; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health nurse; Master's degree, Public Health Nursing; field nurse, two years, and supervisor, four years, VNA; five years, supervisor, county health department; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

NEWS FROM THE FIELD

FIRST NATIONAL CONFERENCE ON FAMILY LIFE

The first National Conference on Family Life has been called in Washington May 6–8 at the request of 110 major national agencies. The movement which resulted in plans for this meeting began in 1944 when the American Home Economics Association first discussed the need for a conference on family life. The National Planning Association joined in efforts to bring together such a group. A general steering committee with the financial backing of the Woman's Foundation in June, 1946, resulted in an agreement by more than 100 coöperating groups to request the President that such a conference be held at the White House.

Eric Johnston, President of the Motion Picture Association of America, and Boris Shishkin, Economist of the American Federation of Labor, are Chairman and Vice-Chairman respectively of the 35 member Board of Directors.

The sponsoring agencies requesting the conference include the American Public Health Association and the National Health Council. The Technical Advisory Committee includes 52 leaders in health, education, social welfare, economics, and science, under the leadership of the program coördinator, Dr. Ernest G. Osborne of Columbia University.

The conference program is divided into three parts: Background Materials, which is largely statistical; Dynamics of Family Interaction; and Action Areas for Families and Organizations. The Chairman of the first section is Alexander Radomski who is the Assistant Program Coördinator of the National Conference on Family Life; of the second section, co-chairmen are Evelyn M. Duvall, Secretary of the National Council on Family Relations and Reuben Hill, Professor of Sociology at Iowa State College. The third section, Health and Medical Care, is divided into 10 subsections, and is under the joint chairmanship of Haven Emerson, M.D., and Leona Baumgartner, M.D.; Coleman Woodbury of the University of Wisconsin heads the Housing Section.

The purpose of the Conference is to find specific ways in which Americans may work together to build their lives around a family core. It will deal with the importance of family living to democracy, the implications of housing, nutrition, child care, etc., for family stability, defining basic principles to help families understand and meet their needs in individual and group living, planning community resources including education for strengthening of families, and training professional workers in the field of family life.

The Conference is limited to 1,000 persons representing the 120 sponsoring agencies. The Secretary is Mrs. Clarice H. L. Pennock, and the national headquarters are at 10 East 40th Street, New York 16.

NATIONAL NUTRITION RESEARCH CENTER

The Medical School of Northwestern University has received from the Spies Committee for Clinical Research a grant of $150,000 annually for 5 years to establish a national center for medical research in the field of nutrition at the University. Tom D. Spies, M.D., known for his work with synthetic folic acid, has been named Chairman of the new department and Professor of Nutrition and Metabolism.

Dr. Spies has been most recently Associate Professor of Medicine at the University of Cincinnati where, under the Spies Committee, he directed the University studies in nutrition in the Cincinnati General Hospital and in

the Hillman Hospital, Birmingham, Ala., which he organized in 1937. In his new capacity, he will continue to direct studies in Hillman Hospital.

ARKANSAS PUBLIC HEALTH ASSOCIATION

At a meeting in Little Rock in November, the organization of the Arkansas Public Health Association was completed. A Constitution and By-Laws were adopted, approximately 300 charter members enrolled and the following officers elected:

President—Edgar J. Easley, M.D., Director, Division of Venereal Disease Control, State Department of Health

Vice-President—Mrs. W. T. Dorrough, Executive Secretary, Arkansas Tuberculosis Association

Secretary-Treasurer—Roy M. Reid, Director of the Division of Public Health Education, State Department of Health

CINCINNATI PUBLIC HEALTH FEDERATION AWARDS

At the annual meeting of the Cincinnati Public Health Federation in December, awards of honor for distinguished service were made to William H. Muhlberg, M.D., and Bleecker Marquette. The awards consisted of a scroll, together with an engraved gold key, as tokens of the community's appreciation and gratitude.

Dr. Muhlberg is President of the Cincinnati Board of Health, of the Federation, and of the Anti-Tuberculosis League, and serves on many other community agency boards and was cited as "a staunch promoter and supporter of improvements in community organization and facilities for greater health protection and better medical care."

Mr. Marquette has since 1921 been Executive Secretary of the Public Health Federation and is also Executive Secretary of the Better Housing League and the Anti-Tuberculosis League. His citation reads in part: "Leader in the planning, organization, and development of Greater Cincinnati's coördinated public health program."

DR. BUSTAMANTE, SECRETARY GENERAL, PAN AMERICAN SANITARY BUREAU

Miguel E. Bustamante, M.D., Dr.P.H., has been appointed Secretary General of the Pan American Sanitary Bureau. Immediately before going to Washington, D. C., he was Director of the Institute of Health and Tropical Diseases and Research Epidemiologist of Mexico, and Professor of Preventive Medicine and Hygiene in the School of Medicine.

Dr. Bustamante received his Medical degree from the National University of Mexico and his Doctor of Public Health degree from Johns Hopkins University.

In recent years, with Drs. Gerardo Varela, Ortiz Mariotte and Roch, Dr. Bustamante reported for the first time in a series of articles the presence in Mexico of Rocky Mountain spotted fever, its regional epidemiology and its transmission in the west and north central zones by the *R. sanguineus*, the characteristics of two strains and those of a fourth rickettsial entity found in the Michoacan State.

INDIANA'S NEW DEPARTMENT OF HEALTH BUILDING

Construction has begun on the new $1,800,000 building for the Indiana State Department of Health. Located on the Indiana University Medical Center campus, it will be completed in January, 1949, and will have twice the space of the present building.

When the new building is completed, the old building will be deeded to the Medical Center for use as administrative offices and clinical laboratories.

THE THREADS OF RESEARCH IN CHILD LIFE

In November, 1947, the U. S. Children's Bureau called together 16 leaders in research in child life for a two day

conference in New York. Through group discussions, the conference considered what research in child life is now going on, in and out of the federal government; on what aspects of child growth and development and of community life in relation to children is research most needed; what the major obstacles to research are; what next steps should be taken; and what contributions the Children's Bureau can make.

In order to answer queries about the conference, the Children's Bureau has summarized some of the highlights. This includes a listing of 136 research projects currently being carried on in agencies outside the government as well as a list of Children's Bureau studies since 1912. This summary of the conference is available from the U. S. Children's Bureau, Washington 25, D. C.

POSTGRADUATE COURSE IN INDUSTRIAL MEDICINE

The Long Island College of Medicine announces its fifth Postgraduate Course in Industrial Medicine. Scheduled for the two week period, April 5–16, it is intended to provide physicians already in industrial practice or those planning to enter it, with information about the most recent developments in the field.

The courses will be given by 60 leaders in industrial medicine, authorities in allied fields, and members of the Medical School faculty. Tuition for the course is $75. Address inquiries to Thomas D. Dublin, M.D., Department of Preventive Medicine and Community Health, 248 Baltic St., Brooklyn 2, N. Y.

ADVERTISING COUNCIL'S CHEST X-RAY CAMPAIGN

An earlier issue of the *Journal* (May, 1947, p. 635) reported preliminary plans for an educational campaign directed toward chest x-raying the entire adult population by the Advertising Council in coöperation with the National Tuberculosis Association and the U. S. Public Health Service.

This campaign has now gone into its first major phase. The first network allocations were given the chest x-ray campaign during the week of January 12 and are being continued on an average of one week each month. Campaign guides, posters, car cards, and other materials have been prepared and sent out. Full information has been sent to all local tuberculosis associations and official health departments. The *NTA Bulletin* for January, 1947, gives details of the campaign as well as a description of the Advertising Council and its activities.

MR. SOLOW TO PAN AMERICAN UNION

In January, Anatole A. Solow began his new work as Housing and City Planning Specialist with the Division of Labor and Social Information of the Pan American Union in Washington, D. C. He will direct the Union's Housing and City Planning Information Service with particular reference to the official agencies and technicians of the Latin American countries.

Previously Mr. Solow was, since 1946, Research Associate of the Committee on the Hygiene of Housing of the American Public Health Association.

ATOMIC ENERGY EXHIBIT

The Brookhaven National Laboratory of the U. S. Atomic Energy Commission is holding a comprehensive exhibit on atomic energy from January 21 to April 5. Held in the American Museum of Natural History in New York City, it is intended to acquaint the public with some of the basic principles of atomic fission, the beneficial applications of nuclear energy, and the United States program in nuclear research and development.

Special group tours of the exhibit may also be arranged through the museum.

NATIONAL COMMITTEE ON LOCAL HEALTH UNITS

Recent issues of the *Journal* (Nov., p. 1502; Jan., p. 108) have reported on the Princeton Conference on Local Health Units and some of the activities flowing out of it. A meeting in New York in January brought further along plans for citizen participation.

After the Princeton Conference, the National Health Council, because of its special interest in this field, was asked to accept leadership in citizen participation in this program. It therefore called the January meeting in order that the agencies themselves might plan next steps. Forty-five of the national agencies represented at Princeton had representation at the January meeting. Among the outstanding features of the meeting was an agency by agency report on activities carried out since the Princeton Conference.

In addition to the items already reported in the January *Journal*, the National Congress of Parents and Teachers held a Health Conference on February 16 and 17 at which all their state health chairmen were briefed on ways by which they might forward the federal legislation sponsored by the National Congress as well as the community organization for extending minimum coverage or increasing the adequacy of present coverage.

Many of the agencies such as the Lions' Club, the American Home Economics Association, and the American Farm Bureau Federation have urged their local branches to study the results of the Princeton Conference in relation to their own community health needs.

Reports were made of articles to appear in various of the national agency journals as well as of plans to keep this matter constantly before state and local groups with appropriate educational material.

At the luncheon of the January meeting Dr. Herman E. Hilleboe, New York State Health Commissioner, outlined briefly the plans for extending county health departments in the state. That the attitude of the local citizenry is the key to early and permanent progress was perhaps his outstanding point. He said that the help of citizens' groups was welcome and essential.

The conference discussed ways of carrying on the enthusiasm developed and furnishing the local agencies interested in the problem with suitable material. A number of regional conferences, for example, were suggested. The conference adopted ten resolutions as shown below and proceeded with the creation of a national committee in accordance with the mandate of Resolution Number 5. This committee is made up of the designated official representatives of each of the agencies that is interesting itself in this problem.

Resolutions Passed by the January 23 Conference

1. That each organization represented at Princeton be urged to approve officially, where possible, the principles of the Princeton resolution as soon as practicable and announce action with appropriate national publicity.

2. That the goal is to obtain complete coverage of all states and all communities by local full-time health units under competent professional direction.

3. That each organization be encouraged to develop a specific program of action adapted to its structure and character.

4. That to assure most effective results in obtaining complete coverage by full-time health units, it is essential that the activities of national agencies, although independent, at the same time be coördinated.

5. That the representatives of the organizations here gathered urge that the National Health Council, representing as it does the common interests of national agencies concerned with public health, be requested to create a National Advisory Committee on Local Health Units, composed of responsible representatives of interested organizations, such as those represented here and at the Princeton Conference, and such other organizations as may be determined subsequently.

6. That this committee, with the coöpera-

tion of the above organizations, seek to develop a central program advisory service, materials and such other clearing house functions as may prove desirable.

7. That representatives at this meeting, in their individual capacities, recognize the necessity for federal assistance to states to complete the coverage of their respective populations and areas with full-time local health units under professional direction.

8. That the representatives at the meeting trust that the National Congress of Parents and Teachers will take primary responsibility for following through with the legislation proposed by the Association of State and Territorial Health Officers, and that such other organizations as were represented at the Princeton Conference, and which may so desire, will take action jointly with the National Congress of Parents and Teachers to support this legislation in principle.

9. That the national organizations be encouraged to begin stimulation of state and local action to obtain the necessary local health units. To this end, it is also suggested that appropriate graphically illustrated educational material be prepared nationally for distribution through local units of national organizations.

10. That each organization urge its state and local affiliates to work coöperatively with existing state-wide and local coöperating agencies or councils in order that there may be a pooling of interests, planning and action in securing the coverage referred to in recommendation 2. From this joint planning permanent organization for coördinated planning may be developed in those places where such does not now exist.

NATIONAL NEGRO HEALTH WEEK

National Negro Health Week will be observed from April 4 to April 11. Its special objective for the current year is: "A Practical Health Program for Myself and My Family: Learn what you ought to know—Health Education; Do what you ought to do—Healthful Living."

The preliminary announcement sent out by the Committee lists a community organization plan and a day by day schedule for Health Week, as well as some 60 suggested sources of coöperation.

For further information, write National Negro Health Week Committee, U. S. Public Health Service, Washington 25, D. C.

ANNUAL PARENTS' MAGAZINE MEDAL TO DR. ELIOT

The 1948 *Parents' Magazine* Medal for Outstanding Service to Children was presented in January to Martha M. Eliot, M.D., President of the Association and Associate Chief of the U. S. Children's Bureau in Washington.

In presenting the medal the speakers, George J. Hecht, publisher of *Parents' Magazine*, and Senator Saltonstall of Massachusetts, praised her work as Director of the Emergency Maternity and Infant Care Program and as Chief Medical Consultant of the International Children's Fund. Said Senator Saltonstall: "Dr. Eliot truly has become a leading authority on child care. You can almost say that whenever child health is mentioned, Dr. Eliot's name comes first in your mind."

INSTITUTE OF EXPERIMENTAL BIOLOGY AND MEDICINE

The U. S. Public Health Service has established an Institute of Experimental Biology and Medicine in the National Institute of Health in Washington. This research institute, combining the functions of the Division of Physiology and of the Pathology and Chemistry Laboratories, is designed to achieve greater coördination of scientific investigations.

William Henry Sebrell, Jr., M.D., Chief of the Division of Physiology, is the Director of the new Institute, serving also as Associate Director of the National Institute of Health.

Dr. Sebrell, an authority in the field of nutrition, has been with the Public Health Service since 1925. In 1940, he received the Mead Johnson Award of the American Institute of Nutrition for research on vitamin B-complex, and in 1946, was awarded the research medal of the Southern Medical Association.

In 1945, he spent 3 months in Europe as nutrition consultant to the U. S. Army's Military Government Public Health Staff, for which he was awarded the Legion of Merit.

PROFESSIONAL RESPONSIBILITIES

The following extract from an article appearing in the December 1, 1947, issue of *The Connecticut Technical Council, Inc.*, gives in compact form the *raison d'être* for the engineering professional societies.

OUR SOCIETIES

PROFESSIONAL RESPONSIBILITIES AND PURPOSES

All engineering societies have been brought into being by ideals for advancement, for improvement or for public service. An examination of these ideals as stated in purposes of various societies reveals a pattern of professional responsibility in six primary categories:

First Responsibility. To extend and advance engineering knowledge and art; to encourage original research to promote standardization of engineering specifications and methods of testing; to maintain a library; to confer honors and awards for outstanding work.

Second Responsibility. To maintain high aims and standards for the education of those who are to become engineers; to foster engineering education; to foster among engineering students the study of philosophy and history, traditions and achievements, duties and social functions of the engineering profession; to encourage the personal and professional development of young engineers.

Third Responsibility. To maintain high standards for entrance into the profession; to aid in adoption of a high standard of attainment for granting the legal right to practice engineering; to maintain high cultural and technical standards for admission to the society.

Fourth Responsibility. To increase the usefulness of the engineering profession; to cooperate with other engineering and technical societies; to advance the unity of the profession; to secure greater public understanding of the purposes of the profession; to secure equitable compensation for engineering services.

Fifth Responsibility. To maintain high standards of conduct between the engineer and his client, his employer, his colleagues, and the public; to maintain high professional standing; to protect the public against unqualified engineering practice.

Sixth responsibility. To minister to the public interest; to encourage a high standard of citizenship among engineers; to encourage engineers to participate in public affairs; to coöperate with governmental agencies on engineering matters; to coöperate internationally on engineering matters.

The above principles were prepared after an analysis of the stated purposes of the various professional engineering societies.

DR. OSBORN IN CONNECTICUT 25 YEARS

In December, the Public Health Council of Connecticut and the staff of the State Health Department, celebrated the completion of a quarter of a century of service by the State Health Commissioner, Stanley H. Osborn, M.D. Dr. Osborn was presented with a traveling bag in appreciation of his many years of service. When he first became Commissioner in 1922, the department's staff numbered 50; expanded services have increased the staff to a current 300.

In point of service, Dr. Osborn is the second oldest State Commissioner of Health in the country. A. J. Chesley, M.D., of Minnesota, has served one year longer, having been appointed Secretary and Executive Officer of the Minnesota State Board of Health in 1921.

FIELD TRAINING PROGRAMS

The recent *Bulletin of Field Training Programs* lists the various programs of training available through the Communicable Disease Center, U. S. Public Health Service, Atlanta, Ga., for the year 1948. Field training for sanitary engineers, sanitarians — general and milk and food, insect and rodent control personnel and various laboratory workers are included. Most of the programs are given at the Center in Atlanta, Ga., although other centers in Savannah, Ga., Topeka, Kans., Troy, N. Y., Columbus, Ga., and Cincinnati, Ohio, are included. As in the past, tuition is free but no stipends are available from the Communicable Disease Center for traveling or living expenses during the course of study. R. A. Vonderlehr

is Medical Director in Charge, and E. S. Tisdale is Chief, Training Division of the Communicable Disease Center.

INDIANA'S FIRST BI-COUNTY HEALTH DEPARTMENT

The Boards of Commissioners of Floyd and Harrison Counties in Indiana with a combined 1940 population of 52,000, passed appropriations for setting up immediately a bi-county public health department. Its full-time medical Health Officer is W. E. Amy, M.D., formerly a practising physician.

Headquarters will be in New Albany. Currently, the staff will include two sanitarians and five nurses with two additional nurses planned for a later date.

A LOUISIANA CITY AND COUNTY CONSOLIDATE THEIR GOVERNMENTS

By a recent vote, the city of Baton Rouge and the parish (county) of East Baton Rouge consolidated their respective governments with a council of nine members. Unified departments of public works, purchasing, finance, and personnel will furnish parish-wide services to a population of more than 100,000.

The health services of city and parish had already been unified before this action. Schools and recreation will not be under the control of the council, the former being governed by a popularly elected council of seven members and the latter by a board created by special legislative act.

FIRST APPROVED HOSPITAL CONSTRUCTION PROJECT TO COMBINE HOSPITAL AND HEALTH SERVICES

The first project to be approved under the 1946 hospital construction act (P.L. 725) is for a combined hospital and health unit in Langdale, Chambers County, Alabama. The project, sponsored by the Chattahoochee Valley Hospital Society in Langdale, was approved by the Surgeon General on November 5, 1947. Langdale is an industrial community (about 2,000 textile mill employees) located in a rural county with a 1940 population of 41,000.

The plans as approved include 82 hospital beds which can be increased to 150 if needed and preventive and public health services. The hospital building will house an outpatient clinic and the county public health department. Total construction cost is estimated at $1,700,000. Dr. C. C. Applewhite, who furnished the above information, observes that, "It is a gratification to us that the first approved project in the country and in District (U. S. Public Health Service) No. 4, combines in one structure facilities for preventive medicine as well as for treatment and care of the ill."

FIRST TRI-COUNTY UNIT IN OHIO

Beginning in January, Ohio's first tri-county health unit began operation. It is a consolidation of two already existing units, Delaware City-County and the bi-county unit of Madison and Union. The total population being served is about 70,000.

The Health Officer of the new tri-county health department is Wayne S. Ramsey, M.D., who has been with the U. S. Public Health Service since January, 1944. Previously, he had seen service in both world wars, with the Pennsylvania State and Alaska Territorial Boards of Health and with the Michigan Crippled Children's Commission.

DEDICATION OF M.I.T. LABORATORIES

The Massachusetts Institute of Technology recently dedicated the William Thompson Sedgwick Laboratories of Sanitary Science of the Department of Civil and Sanitary Engineering, with Dr. John B. Wilbur, Head of the Department, presiding.

Speakers included Professor Samuel C. Prescott, Arthur D. Weston, and Dean Gordon M. Fair of the Harvard School of Engineering. Professor W. E. Stanley described the new facilities and the work they will do. Murray P. Horwood, Ph.D., is in charge of the Laboratory of Sanitary Bacteriology and Research; Clair N. Sawyer, Ph.D., of the Laboratory of Sanitary Chemistry; and Professor Ariel A. Thomas, of the Laboratory of Sanitary Engineering.

NATIONAL ASSOCIATION OF SANITARIANS

The following officers were elected for the year 1948 at the 11th Annual Meeting of the National Association of Sanitarians in Salt Lake City in September, 1947:

President—Mitchell P. Mondala, Washington State Health Department
Vice-President—C. W. Clark, Oregon State Health Department
Jr. Past-President—E. R. Shields, Utah State Health Department
Treasurer—Charles H. Ziegler, City Health Department, Los Angeles
Executive Secretary—Roscoe C. Davis, California State Health Department

MASSACHUSETTS PUBLIC HEALTH ASSOCIATION APPOINTS EXECUTIVE SECRETARY

Elizabeth K. Caso has been appointed Executive Secretary of the Massachusetts Public Health Associaiton. An instructor in nutrition in the Harvard School of Public Health, Mrs. Caso will serve the Public Health Association on a part-time basis. It is hoped that the employment of an Executive Secretary will increase the services the Association can render to its members, and make the agency a more potent influence for the improvement of public health administration in Massachusetts.

LIP READING SCHOLARSHIP

The Kenfield Memorial Fund, through the American Hearing Society, is offering a scholarship of $100 to a prospective hard of hearing teacher of lip reading who lives in the United States.

Applicants must have: personal characteristics necessary for successful teaching; ability to read lips and professional training in lip reading; a bachelor's degree or its equivalent. The prospective teacher who wins the scholarship may take the normal course from any normal training teacher or school or university in the United States offering a course acceptable to the Teachers' Committee of the American Hearing Society.

Applications must be filed between March 1 and May 1, 1948, with Miss Rose V. Feilbach, 2431–14th Street, N.W., Washington 9, D. C.

AMENDMENTS TO NEW YORK STATE SWIMMING POOL REGULATIONS

The December 15, 1947, issue of New York State *Health News* includes as a supplement an amendment to the *State Sanitary Code* covering swimming pools and bathing beaches. In preparing the material for the amendment the suggested revision of the Code was sent to several municipal and county health departments for criticism.

In addition to clarifying the previous section of the *State Sanitary Code* dealing with swimming pools and bathing beaches some subjects have been added and others expanded. Requirements on dressing and toilet rooms now require adequate shower bath facilities at artificial swimming pools where the source of bacterial pollution is the bathers themselves. The maximum number of bathers permitted to use such a pool is now based on the surface area of the pool rather than on water volume. Filtration must be provided at artificial pools when required by the local health officer or the State Commissioner of Health. Regulations covering the sanitary

quality of water and the techniques used in chlorination have been modernized, and measures for the safe handling of chlorine gas have been added. Requirements on bacterial quality of water at partly artificial swimming pools or at bathing beaches have not been specified because numerical bacterial standards for this purpose are not available. The local health officer or the State Commissioner of Health is given authority to prohibit bathing where a menace to the health of bathers is believed to exist.

NSPB MOVES TOWARD COMMUNITY COÖPERATION

At the December meeting of the Board of Directors of the National Society for the Prevention of Blindness, the following resolution prepared by the Society's Committee on Plan and Scope was approved:

> It is the stated policy of the National Society for the Prevention of Blindness to participate in joint planning and coöperative action with other educational, health, and social agencies, both voluntary and official. It is recommended, therefore, that state, territorial, city and county prevention of blindness associations likewise coöperate with appropriate agencies in educational programs, planning for community health and welfare, and other activities.

NEW OFFICERS OF FLORIDA PUBLIC HEALTH ASSOCIATION

At its Annual Meeting held in Tampa, October 23–25, 1947, the Florida Public Health Association elected the following new officers to serve for 1948:

President—Wilson T. Sowder, M.D., Jacksonville
1st Vice President—Russell Broughman, Miami
2nd Vice President—Martha Stetson, St. Petersburg
Secretary—Fred B. Ragland, Jacksonville
Treasurer—Elsie Hyatt, Jacksonville

DR. SELLERS, GEORGIA HEALTH COMMISSIONER

In December, Thomas A. Sellers, M.D., was appointed Georgia Health Commissioner by the State Board of Health, following the retirement of T. F. Abercrombie, M.D., who has been Commissioner since 1917. Dr. Sellers has been in the State Health Department more than a quarter of a century, during nearly all of that time as Director of Laboratories.

Dr. Abercrombie remains in the department as Director Emeritus and in an advisory capacity.

At the same Board meeting, John E. Ransom was made Director of the newly created Division of Hospital Construction. He has been serving in the department as hospital consultant, having formerly been Director of the Hospital Council of New York.

OREGON'S NEW DISTRICT HEALTH UNIT

Lincoln and Tillamook Counties, with a 1940 combined population of 27,000, have formed a district health unit under the law enacted by the 1947 Oregon legislature. The position of health officer had not been filled in December and the unit was operating with the temporary services of a part-time health officer.

Two other counties that had been operating on a coöperative basis—Washington and Yamhill—with 65,000 population, have also organized under the new law. Three other coöperative units including 7 counties are also expected to organize formally under the new law.

INTER-AMERICAN SANITARY ENGINEERING CONGRESS

The first Inter-American Sanitary Engineering Congress will be held in the University of Chile, Santiago, April 8–14. Joining with the Inter-American Association of Sanitary Engineering in sponsoring the Congress are the Chilean Ministries of Public Health and of Public Works, the Santiago Department of Water and Sewerage, the Pan American Sanitary Bureau, and the Institute of Inter-American Affairs.

Further information may be secured from Donald L. Snow, Acting Secretary, Inter-American Association of Sanitary Engineering, 2001 Connecticut Ave., N.W., Washington 8, D. C. Details on the United States manufacturers' exhibits are being handled by Arthur T. Clark, Water and Sewage Works Manufacturers Association, 170 Broadway, New York 7.

DR. SCHEELE APPOINTED SURGEON GENERAL, U. S. PUBLIC HEALTH SERVICE

It was announced at the White House on February 12 that Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service since 1936, would be succeeded at the expiration of his term on April 6, 1948, by Leonard A. Scheele, M.D., now an Assistant Surgeon General of the U. S. Public Health Service and Head of the National Cancer Institute, Bethesda, Md.

Dr. Parran, who is completing his third term of 4 years as Surgeon General, was appointed to the post in April, 1936, by President Roosevelt. According to the report, Dr. Parran will resume his permanent status in the Service as Medical Director and has announced that he has no further plans after his retirement as Surgeon General.

Dr. Parran stated that the President was to be congratulated upon his appointment of Dr. Scheele who he said was "one of the outstanding figures in public health in the United States, possessing both the professional and personal qualifications to be a great Surgeon General. I wish for him long years of useful public service in this responsible position."

During Dr. Parran's 12 years as Surgeon General, many new programs have been developed by the Service, including Venereal Disease and Tuberculosis Control Programs, the National Mental Health Program, the National Cancer Program, the National Hospital Survey and Construction Program and, during the war period, the Cadet Nurse Corps. In addition, an expansion of the National Health Institute and the Grants-in-Aid Programs were accomplished. Budgets of the Public Health Service during this period increased from less than 15 million to more than 100 million dollars a year.

Dr. Scheele, who is a native of Indiana, was born July 25, 1907 and is a graduate, in 1934, of the Wayne University School of Medicine, Detroit. He has been a member of the Regular Corps of the Public Health Service since July 10, 1934, and was on a European assignment with the Army during the war after service with the Office of Civilian Defense.

OFFICERS OF AMERICAN HOSPITAL ASSOCIATION

The following officers of the American Hospital Association were elected at its annual meeting in St. Louis:

President—Graham L. Davis, Director, Division of Hospitals, W. K. Kellogg Foundation

President-Elect—Joseph G. Norby, Superintendent, Columbia Hospital, Milwaukee

First Vice President—M. H. Eichenlaub, Superintendent, Western Pennsylvania Hospital, Pittsburgh

Second Vice President—Ruth C. Wilson, Executive Director, Martime Hospital Service Association, Moncton, New Brunswick

Third Vice President—F. Ross Porter, Administrative Assistant, Duke Hospital, Durham

The officers reported on page 1639 of the December issue of this *Journal* should have been identified as officers of the American College of Hospital Administrators.

NEW OFFICERS OF THE SOCIEDADE BRASILEIRA DE HIGIENE

At the annual election of officers of the Sociedade Brasileira de Higiene held on December 22, 1947, Dr. Mar-

colino Gomes-Gandau was elected *President* of the Society and Dr. Geraldo Paula Souza *Vice-President*.

PERSONALS

Central States

VIOLET DUBOIS,† has been appointed Health Educator of the Omaha City-Douglas County Health Department in Nebraska where she will also be on the teaching staff of Omaha University. Miss DuBois was formerly Assistant Director of Health Education, Nebraska State Health Department.

PAUL FUGAZZOTTO, Ph.D.,† has been appointed serologist in the Bureau of Laboratories, Indiana State Health Department. He was formerly with the Michigan State Health Laboratories, first in the Grand Rapids Laboratory working with PEARL KENDRICK, M.D.,* in her pertussis studies, and later at the Central Laboratory in Lansing.

FRED L. MAYES, M.D.,* has been appointed Health Officer of Wichita, Kan., effective June, 1948. Dr. Mayes has been Assistant State Health Officer of Kansas and Director of the Division of Local Health Administration, and is currently on leave studying for a Master's Degree in public health at the Harvard School of Public Health.

THURMAN B. RICE, M.D.,† who for some years has been Chairman of the Department of Bacteriology and Public Health, University of Indiana School of Medicine, has now been named Chairman of the new Department of Public Health.

Eastern States

FRANKLYN B. AMOS, M.D.,* has been appointed Director of the new Office of Professional Recruitment and Training of the New York State Health Department. Dr. Amos has been with the department since 1935, as Assistant Director of local health administration since 1940.

WILLIAM A. BRUMFIELD, M.D.,* has been appointed Deputy Commissioner of Health of New York State succeeding JAMES E. PERKINS, M.D.,* who resigned to become Managing Director of the National Tuberculosis Association. Dr. Brumfield has been Director of the Division of Venereal Disease Control of the Department for the past 12 years.

JAMES P. DIXON, M.D.,† Philadelphia, Pa., became Director of Denver General Hospital on October 1. He has been administrative intern under LUCIUS R. WILSON, M.D., at the Episcopal Hospital in Philadelphia, and is a former fellow in public administration and hospital administration at the W. K. Kellogg and Rockefeller Foundations.

JAMES A. DOLCE, M.D., M.P.H.,* Chief of Division of the Local Health Administration, Connecticut State Health Department since July 1, 1945, has been appointed Deputy Commissioner of the Buffalo City-Erie County, New York Department of Health.

LYMAN C. DURYEA, M.D., M.P.H.,* who served for the past year as Medical Director of the Research Council on the Problems of Alcohol, New York, N. Y., has resigned to accept a commission with the U. S. Army. He has been assigned as Commanding Officer of the 269th General Hospital, Fitzsimmons General Hospital, Denver, Colo. JOSEPH HIRSH,* Associate Director of the Council, is serving as Acting Director.

CARL L. ERHARDT,† Assistant Director of the Bureau of Vital Statistics,

---

* Member A.P.H.A.
† Fellow, A.P.H.A.

Connecticut State Health Department since April 15, 1947, will return to the New York City Health Department as Director of the Bureau of Records and Statistics. Mr. Erhardt had previously been associated with the New York Bureau for 11 years.

STEPHANIE F. FORD,† on January 5 assumed the position of School Health Educator of the New York Tuberculosis and Health Association. Miss Ford was formerly with the public school system of Hamden, Conn.

PAUL R. GERHARDT, M.D.,† has been appointed Director of New York State Health Department's new Division of Cancer Control, effective in January. He succeeds MORTON L. LEVIN, M.D.,* who was named Assistant Commissioner for Medical Administration last October. Dr. Gerhardt comes to the Department from the West Virginia State Health Department where he has been Director of the Division of Cancer Control since April, 1944.

GERMAINE A. GUNTZER, M.D.,† has been appointed to the medical staff of Leahi Hospital, the 900 bed tuberculosis sanatorium at Honolulu, Hawaii. He has most recently been Medical Consultant for Veterans of the National Tuberculosis Association in New York.

CHARLES HAYDOCK,† Consulting Engineer, Philadelphia, Pa., has been appointed by GOVERNOR JAMES H. DUFF as a member of the Pennsylvania State Registration Board for Professional Engineers.

H. R. KILANDER, Ph.D.,† has resigned as Associate in Health Education of the National Tuberculosis Association, New York, N. Y., to become Associate in Health Education of the U. S. Office of Education, Washington, D. C.

DOMINICK J. LACOVARA, M.D., Ph.D.,† formerly resident psychiatrist at Matteawan State Hospital, Beacon, N. Y., late in September, 1947, became resident psychiatrist of Craig House, Beacon, N. Y., a private sanitarium, and was appointed consulting psychologist to Matteawan State Hospital.

EUGENE L. LEHR, C.E.,† Housing Engineer with the Bureau of Sanitary Engineering, Connecticut State Health Department since August, 1938, has taken up his duties as town engineer and Superintendent of Public Works, Fairfield, Conn. This is a position created by the new charter adopted at the 1947 Session of the Connecticut General Assembly.

JOHN J. LENTZ, JR.,† who, since he left the Army and served with the Division of Medical Sciences of the National Research Council in Washington, D. C., has now joined the staff of Young and Rubicam, New York, N. Y., to be concerned with research for health and medical advertising.

CHARLES MCCLAIN, who has been rehabilitation consultant of the National Tuberculosis Association, New York City, since 1944, has been named Director of the new rehabilitation department of Mont Alto Sanatorium in Pennsylvania.

JOHN F. MCCORMACK, former Superintendent of Presbyterian Hospital, New York, N. Y., has been appointed Executive Vice-President of United Medical Service in New York City.

CHARLES L. NEWCOMB, Director of the Christmas Seal Sale of the National Tuberculosis Association for 18 years, retired December 31, 1947. Miss Frances Brophy, Associate, Seal Sale Service, has been appointed Acting Director.

CLELAND A. SARGENT, M.D.,† has been appointed Health Commissioner of Syracuse, N. Y., effective June 1, 1948, when the present Commis-Commissioner, H. BURTON DOUST,

M.D.,† retires. Dr. Sargent is at present a District Health Officer of the New York State Department of Health.

RALPH SIKES, M.D.,* former Health Commissioner of Norwalk, Conn., is Health Commissioner of Yonkers, N. Y., succeeding BERWYN MATTISON, M.D.,† who recently became Buffalo City–Erie County Health Commissioner.

NORMAN SURVIS, M.D., New Rochelle, N. Y., has been appointed Director of the Division of Pediatrics of the Westchester County Health District, White Plains, N. Y., succeeding DOROTHY WORTHINGTON, M.D.,* resigned.

MARGARET WOLCOTT, R.N., M.P.H.,† has been appointed Director of Nurses of the Cortland County (N. Y.) Health Department. Since 1931, Miss Wolcott has been with the New York State Department of Health, having been assigned to the Cortland County Health Department as Supervising Nurse in 1943.

Southern States

CHANGES IN FLORIDA HEALTH PERSONNEL:

JOHN ROSS HAGUE, M.D.,† formerly of Washington, D. C., has been appointed Health Officer of the Indian River, St. Lucie and Okeeshobee Counties Health Unit, with headquarters at Fort Pierce.

M. LEWIS GRAY, M.D., formerly Health Officer of the Jackson and Washington Counties Health Unit is now Health Officer of the Broward County Health Department with headquarters at Fort Lauderdale. He succeeds WILLIAM C. HATCHETT, M.D., who resigned due to ill health.

ROBERT H. HEAD, M.D., has been appointed Health Officer of the Jackson and Washington County Health Departments, with headquarters at Marianna.

CHARLES G. CHAPLIN, M.D., has been appointed Health Officer of the Jefferson County Heal h Department with headquarters at Monticello. Formerly on the staff of Englewood Hospital, Chicago, Ill., he succeeds B. L. ARMS, M.D., who is retiring.

WILLIAM G. C. HILL, M.D., Director of the Putnam and Flagler County Health Departments has resigned his position.

FRANCIS M. COY, M.D., succeeded HARRY W. HOLLINGSWORTH, M.D., on February 2 as Director of the Highlands, Glades, and Hendry County Health Units.

CARL J. HEISSER,† has resigned his position as Medical Statistician in the Medical Statistics Division, Bureau of Medicine and Surgery, Navy Department, Washington, D. C., to accept the position of Superintendent and Registrar of the Bureau of Vital Statistics of the Toledo, Ohio, Department of Health.

MARK DEXTER HOLLIS,† recently Executive Officer in the Office of the Surgeon General, has been appointed Chief of the Sanitary Engineering Division of the U. S. Public Health Service, with the rank of Assistant Surgeon General. He was formerly Director of the Service's Communicable Disease Center in Atlanta where he developed a program for malaria and typhus control.

CLARKE W. MANGUN, JR., M.D.,† is the new Director of Tuberculosis Control Division of the Kentucky State Department of Health. Formerly in the same position in the Florida State Department of Health, he has most recently attended the Columbia University School of Public Health, New York, N. Y., where he received

---

* Member A.P.H.A.
† Fellow, A.P.H.A.

his Master of Public Health degree in June, 1947.

GRADIE R. ROWNTREE, M.D.,* Deputy Director of Public Health, Louisville–Jefferson County, Kentucky Health Department, resigned on January 1 to become Medical Director of the C. T. Dearing Printing Company. WILLIAM F. LAMB, M.D., M.P.H.,† formerly Assistant Director in charge of communicable diseases succeeded him as Deputy Director of the Health Department.

AGNES SCHULZ became nutrition consultant for the Oklahoma State Department of Health, on January 1, 1948. She succeeds MAURINE MEIER LEIGHTON, resigned.

CHARLES A. SMITH, M.D., was named Director of the Mental Hygiene Division, Oklahoma State Department of Health, on December 1. Dr. Smith is now Assistant Professor of Psychiatry and Neurology of the University of Oklahoma School of Medicine.

MARTHA PETTIT VAN METER,† became Acting Director of the Division of Public Health Education of the Kentucky State Health Department in October, 1947.

Western States

HERBERT BAUER, M.D.,† has resigned as San Luis Obispo County Physician for a year's study in public health on a fellowship granted by the National Institute of Health, Washington, D. C. Dr. Bauer will study at the School of Public Health, University of California.

MARTIN D. BAUM, D.V.M., M.P.H.,† formerly City Veterinarian and Director, Division of Milk and Meat Inspection, City Health Department, Los Angeles, Calif., has been appointed Public Health Veterinarian, U. S. Public Health Service, assigned to Colorado State Department of Public Health, Denver, Colo.

HELEN HORKAVI,† was appointed Tuberculosis Nursing Consultant of the Arizona State Department of Health beginning December 1, 1947. She has served in the Pima County Health Department in Tucson, Ariz., and for the past 3 years as Director of Public Health Nursing, Marquette University, Milwaukee, Wis.

ROLAND H. LODER, M.D., M.P.H.,* became the Health Officer of Weld County, Colorado, effective January 1. For 10 years previously, he had been Director of Maternal and Child Health of the Nebraska State Health Department.

CLARA WOLFE, R.N., will serve as Educational Director for the Veterans' Administration in Oregon having resigned as consultant nurse for the Oklahoma State Department of Health.

Other Areas

L. W. FITZMAURICE, M.D.,* Director of Medical Services, Kingston, Jamaica, has recently been elected a Fellow of the Royal Sanitary Institute of London, England.

SÉRVULO LIMA, M.D.,† has resigned from the Servicio Especial de Saude Publica, Rio de Janiero, Brazil, and MARCOLINA GOMES-CANDAU, M.D.,† has succeeded him as Superintendent.

NEIL P. MACPHAIL, M.D., received the 1948 Richard P. Strong Medal for outstanding service in tropical medicine at the annual dinner of the American Foundation for Tropical Medicine in New York on January 8. Dr. MacPhail is surgeon and sanitarian of the United Fruit Company, stationed in Quirigua, Guatemala.

F. MALO-JUVERA, M.D., M.P.H.,† has been promoted from Chief of the Division for Training of Health Personnel to Technical Adviser to the Undersecretary, Ministry of Public Health and Welfare, Mexico, effective January 1.